Honeywell

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MK VI
MK VIII
Enhanced Ground Proximity Warning System
(Class A TAWS)

Installation Design Guide

Hardware/Software Part Numbers:

965-1180-020
965-1190-020
965-1210-020
965-1220-020

Release Date: July 14, 2003

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SECTION I

GENERAL INFORMATION

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SECTION I – GENERAL INFORMATION

1.1 Introduction

The Honeywell MK VI/MK VIII Enhanced Ground Proximity Warning System (MK VI/MK VIII EGPWS) provides alerts and warnings to prevent controlled flight into terrain (CFIT).

This Installation Design Guide must be used in conjunction with the Interface Description Document (Appendix E) for the MK VI/MK VIII Enhanced Ground Proximity Warning System (MK VI/MK VIII EGPWS) to select features and design the installation for this system.

It is assumed that the user of this document is familiar with avionics installation practices and aircraft systems associated with the installation and operation of the MK VI/MK VIII EGPWS. It also assumes access to pertinent aircraft wiring diagrams, modification records and manuals.

The information contained herein, together with general procedures outlined in FAA AC.43.13 must be followed carefully to assure a safe, electrically sound, certifiable and operational installation.

The contents of this document are for information and reference only and must not be construed as formal FAA approved work authorization.

1.2 Applicability

This manual is applicable only to MK VI/MK VIII EGPWS computers with the following part numbers:

MK VI 965-1180-020 965-1190-020
MK VIII 965-1210-020 965-1220-020

Part numbers 965-1190-xxx and 965-1220-xxx include an internal GPS card.

1.3 How To Use This Document

Section 1 provides a system overview.
Section 2 provides mechanical installation and location information.
Section 3 provides information and instructions for selecting required features of the EGPWS.
Section 4 provides Configuration Module programming instructions.
Section 5 provides certification requirements.
Section 6 provides a pin to pin comparison of the classic MK VI GPWS to the MK VI/MK VIII EGPWS.
Appendix A Customer Worksheet.
Appendix B Sample Wiring Diagrams.
Appendix C provides WinViews operation instructions.
Appendix D provides Vendor Contact Information
Appendix E Interface Description Document

1.4 Reference Documents

Following is a list of Honeywell reference documents:

965-1180-601	Product Specification for the MK VI and MK VIII Enhanced Ground Proximity Warning System (EGPWS)
965-1180-201	Outline, MK VI EGPWC (without GPS)
965-1190-201	Outline, MK VI EGPWC (with GPS)
965-1210-201	Outline, MK VIII EGPWC (without GPS)
965-1220-201	Outline, MK VIII EGPWC (with GPS)
060-4199-180	Line Maintenance Manual
060-4267-000	MK VIII EGPWS Terrain Database Airport Coverage List (3500' Runways)
060-4326-000	MK VI / MK VIII EGPWS Terrain Database Airport Coverage List (2000' Runways)
060-4199-194	MK VI / MK VIII EGPWS Generic AFM Supplement
060-4314-000	MK VI / MK VIII Enhanced GPWS Pilot's Guide
060-4188-023	MK VIII Bizjet Flight Test Procedure
060-4188-038	Flight Test Procedure for EGPWS with Internal GPS card
060-4188-041	MK VI / MK VIII GA Fast/GA Slow General Flight Test Procedure
060-4167-158	MK VI / MK VIII Installation Ground Test Procedure
060-4199-190	Trouble Shooting Guide
060-4199-182	MK VI / MK VIII Failures Modes, Effects, and Safety Analysis
076-4610-000	MK VI / MK VIII Failure Modes, Effects, and Criticality Analysis

1.5 Description of Equipment

The MK VI/MK VIII EGPWS is a rack mount ground proximity warning (GPWS) and terrain awareness and warning (Class A TAWS) computer. Some of the system features include:

- Basic Ground Proximity Warning Modes 1-5
- Mode 6 Altitude Callouts and Bank Angle alert
- Terrain Clearance Floor
- Terrain and Obstacle Awareness alert and display
- Terrain map with runways >= 2000 feet in length (optionally >= 3500 feet in length on the MK VIII EGPWS)
- Internal GPS card (MK VI 965-1190-0XX and MK VIII 965-1220-0XX only)
- Front loading updateable database (requires Smart cable)
- External Configuration Module (with a Real Time Clock for use with Internal GPS)
- Internal heater blanket for operation outside of the heated area of the aircraft
- Fixed Gear operation

1.5.1 MK VI EGPWS Computer

The MK VI EGPWS computer is available under P/N 965-1180-0XX without internal GPS and P/N 965-1190-0XX with internal GPS. The MK VI EGPWS computer is intended for small turboprop aircraft that provide a mixture of analog and digital interfaces. The type of supported displays is limited and does not typically include EFIS displays (Collins ProLine II and Bendix EFIS 40/50 are supported). The terrain database included with the MK VI EGPWS computer is regional having three separately defined databases for the AMERICAS (North & South America), ATLANTIC (Europe/Asia/Africa), and PACIFIC (Asia/Australia).

1.5.2 MK VIII EGPWS Computer

The MK VIII EGPWS computer is available under P/N 965-1210-0XX without internal GPS and P/N 965-1220-0XX with internal GPS. The MK VIII EGPWS computer is intended for regional turboprop and small turbofan aircraft that provide a mixture of analog and digital interfaces. The type of supported displays is limited and includes some EFIS displays. The terrain database included with the MK VIII EGPWS computer is global.

1.5.3 MK VI/MK VIII EGPWS Configuration Module

The MK VI/MK VIII EGPWS Configuration Module is available under P/N 700-1710-020. The MK VI/MK VIII EGPWS use a Configuration Module installed in the aircraft wiring to store aircraft/EGPWS interface configuration and includes a Real Time Clock for EGPWS installations using internal GPS. The Configuration Module is read by the EGPWS only during power up. The configuration is copied into Non Volatile Memory (NVM) of the EGPWS. The Configuration Module is programmable via an RS-232 interface with the EGPWS. The contents of the Configuration Module can also be read back via the same RS-232 interface. An optional Configuration Module is available under P/N 700-1710-001 for non-Internal GPS operation only.

The 700-1710-020 Configuration Module includes a GPS Real Time Clock (RTC) counter and position memory to aid in GPS initialization. A capacitor will keep the position memory retained and clock current for

approximately 35 days. GPS initialization time should be less than 3 minutes with active RTC data. If the capacitor has discharged then GPS initialization time may be as long as 10 minutes.

1.5.4 GPS Antenna and Cabling

EGPWS installations using the internal GPS require a GPS antenna and cabling. The GPS antenna should meet the following qualifications:

Frequency:	1575.42 MHz
Impedance:	50 ohms
Gain:	33 dB max, 26.5 dB preferred
Power:	5 VDC
Qualification:	TSO C129 or C129a or C144

Antenna gain is limited to 33dB gain, maximum. Antennas with 26dB gain are preferred. There are Active GPS antennas with higher gain. However, as the active antenna amplifiers amplify noise as well as the signal, this can overdrive the GPS input AGC circuitry and actually reduce performance.

The following GPS antennas are found to be compatible with the EGPWS internal GPS card. Other GPS antennas may be found compatible, contact EGPWS engineering for assistance. It is the responsibility of the OEM or owner/operator (and ultimately the regulatory authorities) to assess the antenna acceptance criteria relative to ARINC, MIL, or other specifications. Boeing has certified the Sensor Systems antenna S67-1575-133 (an ARINC 743A antenna with a 33dB gain) for use on all A/C. This antenna is certified for HIRF/EMI, Class 1 flight critical operation. As a result, it is very expensive (about 3X other versions).

King KA 92	P/N 071-01553-0200	TSO-C129
Sensor Systems	P/N S67-1575-52	TSO-C129, ARINC 743A
Sensor Systems	P/N S67-1575-133	TSO-C129a, ARINC 743A

The EGPWS requires an input signal of no less than -106 dB (at the EGPWS-GPS coax connector). Installers need to calculate signal strength, plus antenna gain, minus cable line loss to ensure that the input signal does not exceed the -106 dB limit. To calculate signal strength at the EGPWS coax connector, assume a received signal strength of -118 dB at the antenna (this is average signal strength from a GPS satellite at zenith over the antenna). Add the gain of the antenna, then subtract the line loss of the coax cable, and insertion loss at each connector, except at the EGPWS. Assume 0.6dB insertion loss per connector.

EXAMPLE: Active GPS Antenna with 26dB gain. A 40 foot coax cable run with 1 coax connector (at the rack disconnect). The cable has a specified line loss of 0.25dB/foot.

-118dB (received signal)
+ 26dB (antenna gain)
-92dB
-10dB (line loss) (0.25dB/foot x 40 foot run)
- 0.6dB (rack coax connector insertion loss)
= -102.6dB at EGPWS coax connector, better than required -106dB. This is an acceptable installation.

1.5.5 OAT Sensor

The EGPWS uses a separate OAT sensor (Outside Air Temperature) to measure outside air temperature on aircraft that do not have another compatible source of outside air temperature. Outside Air Temperature is used by the EGPWS along with pressure altitude in the Geometric Altitude computation. If Outside Air Temperature is not available, Geometric Altitude is computed using pressure altitude and GPS Altitude with a corresponding reduction in accuracy. Honeywell engineers have determined that the reduction in accuracy is small because the GPS Altitude is the strongest element in the computation.

Geometric Altitude is computed by the EGPWS to reduce or eliminate errors potentially induced in corrected barometric altitude by temperature extremes, non-standard altitude conditions, and altimeter miss-sets. Geometric Altitude also allows continuous EGPWS operation in QFE environments without crew intervention.

1.5.6 Smart Cable (PCMCIA Interface)

The EGPWS Smart Cable (part number 951-0386-001) is a removable PCMCIA card interface. The Smart Cable is compatible with Honeywell supplied ATA style PCMCIA cards for use with MK VI and MK VIII EGPWS. The purpose of the Smart Cable in the EGPWS system is for upload of software and databases and also for download of EGPWS Flight History. The Smart Cable loading operation will closely emulate that of an ARINC 615 Data Loader. (Reference Figure 1-1 MK VI/MK VIII EGPWS SMART CABLE)

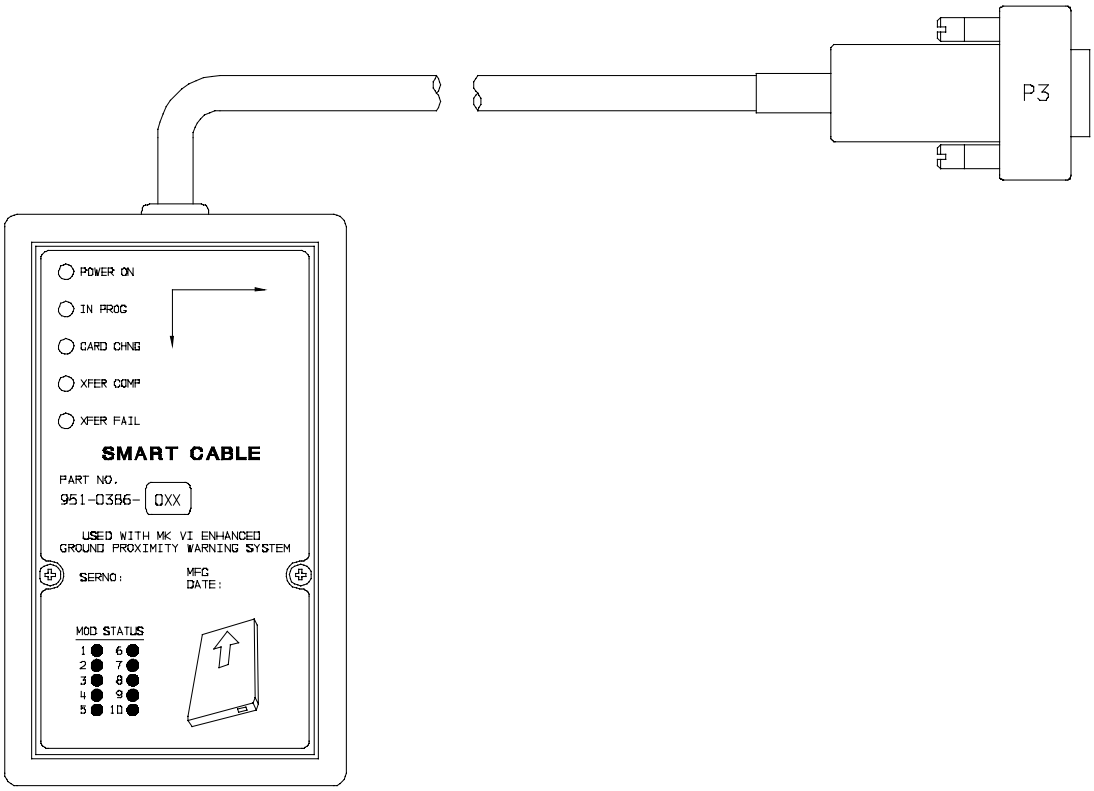

FIGURE 1-1 MK VI/MK VIII EGPWS SMART CABLE

1.6 Technical Characteristics

MK VI / VIII EGPWS	
TSO Compliance:	(MK VI) TSO-C92c, TSO-C151b Class A (MK VIII) TSO-C92c, TSO-C151b Class A, TSO-C117a Application for UKCAA Spec 14 is in process
Physical size (HxWxD):	6.20" x 3.04" x 10.30"
Weight:	3.9 pounds maximum
Mounting:	Standard 3 inch King Radio rack
Temperature (operational):	-55°C to +70°C (F2)
Altitude range:	55,000 feet (F2)
Cooling:	No cooling necessary
Shock:	No shock mounting required
Power Consumption (28 VDC):	2.5 Amps max 9 watts – no warning +7 watts – with warning over 8 ohm speaker +3 watts – with GPS card +49 watts – with heater blanket on

Configuration Module	
TSO Compliance:	TSO-C151b
Physical size:	2.68" x 1.51" x 0.32" (fits Positronic connector backshell)
Weight:	<1 pound with connector and backshell
Mounting:	Mounts to Positronic connector backshell
Temperature (operational):	same as MK VI/MK VIII EGPWS
Altitude range:	same as MK VI/MK VIII EGPWS
Cooling:	No cooling necessary
Shock:	No shock mounting required
Power Consumption (5 VDC):	from MK VI/MK VIII EGPWS

GPS Antenna Sensor

See Section 1.5.4, ARINC 743A,TSO-C129A and Manufacturer's specifications.

OAT Sensor

Nominal 500 ohm Temperature probe, resistance at 0°C 500-ohm ± 0.6 ohm, Range -70°C to +60°C (reference ARINC 575 Section 3.8 or ARINC 706 Section 4.8). See Manufacturer's specifications.

1.7 Units Supplied

1.7.1 MK VI EGPWS

The MK VI EGPWS is available in two versions, with internal GPS card or without. The part number for the units is as follows:

965-1180-XXX without internal GPS card [2]

965-1190-XXX with Internal GPS card [2]

The MK VI EGPWS is normally shipped with an AMERICAS Terrain database. When ordering a MK VI EGPWS that will be operating in the ATLANTIC or PACIFIC[1] region the specific Terrain database must be specified with the order.
NOTE 1: Terrain Database cards for the ATLANTIC or PACIFIC region are no longer required to be ordered separately.
NOTE 2: -XXX defines Application software version.

1.7.2 MK VIII EGPWS

The MK VIII EGPWS is available in two versions, with internal GPS card or without. The part number for the units is as follows:

965-1210-XXX without internal GPS card [1]

965-1220-XXX with Internal GPS card [1]

The MK VIII EGPWS is shipped with a world Terrain database.
NOTE 1: -XXX defines Application software version.

1.7.3 Configuration Module

The MK VI/MK VIII EGPWS Configuration Module is available in two versions. When ordering the Configuration Module, order part number 700-1710-020 or part number 700-1710-001. The part number 700-1710-020 is required for installations with internal GPS.

1.7.4 Smart Cable (PCMCIA Interface)

The MK VI/MK VIII EGPWS Smart Cable is available in one version. The Smart Cable is used for Line Maintenance; Application/Configuration code and Terrain Database uploads and Flight History downloads. **Only one Smart Cable is required for an installation house or operator**. When ordering the Smart Cable, order part number 951-0386-001.

1.8 Installation Kits and Accessories

NOTE: Not all installation kits are immediately available, contact Honeywell Order Administration (425-885-8719) for availability.

1.8.1 MK VI/MK VIII EGPWS Installation Kits

Note: For all parts in the Installation kits the weight of each part is less than 0.25 pounds.

(A) Retrofit classic MK VI GPWS installation

The MK VI/MK VIII EGPWS Installation Kit, P/N 755-7013-011, contains the following parts:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Positronic Ind.	RD50F1OJVLC-15	P2 connector	1	EA	440-1233-001
Honeywell	700-1710-020	Configuration Module	1	EA	700-1710-020

(B) New EGPWS installation

The MK VI/MK VIII EGPWS Installation Kit, P/N 755-7013-010, contains the following parts:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Positronic Ind.	DD78F1OJVLC-15	P1 connector, female	1	EA	440-1158-009
Positronic Ind.	RD50F1OJVLC-15	P2 connector, female	1	EA	440-1233-001
Honeywell	700-1710-020	Configuration Module	1	EA	700-1710-020

Bendix/King	071-04003-0002	Computer Mounting Tray	1	EA	405-0383-001

1.8.2 RS-232 Cable

The MK VI/MK VIII EGPWS RS-232 Cable can be ordered using the following part numbers:

NOTE: The RS-232 Cable can be built by the Installer/Operator per the description in Section 4.4.2.

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Honeywell	704-2617-001	RS-232 Cable	1	EA	704-2617-001

1.8.3 Smart Cable

The MK VI/MK VIII EGPWS Smart Cable can be ordered using the following part numbers:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Honeywell	951-0386-001	Smart Cable	1	EA	951-0386-001

1.8.4 Terrain Database Cards

The MK VI EGPWS Terrain Database Cards can be ordered using the following part numbers:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Honeywell	718-1391-xxx	North & South America	1	EA	718-1391-xxx
Honeywell	718-1392-xxx	Europe, Africa, Asia	1	EA	718-1392-xxx
Honeywell	718-1393-xxx	Asia, Australia, Pacific	1	EA	718-1393-xxx
Honeywell	402-6075-xxx	Label, TDB Front Panel	1	EA	402-6075-xxx

1.8.5 Flight History Card

The MK VI/MK VIII EGPWS Flight History Card can be ordered using the following part numbers:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Honeywell	300-1151-006[1]	Flight History Download	1	EA	300-1151-006[1]
Honeywell	718-1593-001[2]	Flight History Download	1	EA	718-1593-001

Note 1: Unprogrammed (blank) 32 Mb card ATA PCMCIA card.

Note 2: Programmed 32 Mb card ATA PCMCIA card.

1.9 Accessories not Supplied

1.9.1 ARINC 453 Terrain Display wiring

The Terrain display wiring (ARINC 453) must meet the display manufacturer's specifications including termination method. ARINC 453 bus wiring must meet the following requirements:

- Cable length must be less than 300 feet (91.4 meters).
- Wire to wire capacitance must not exceed 50 pF/foot.
- Shielded twisted pair with not less than one twist per inch.
- Impedance of 78 ohms ±10% at 1 MHz (ARINC 708 WXR).
- Impedance of 70 ohms ±10% at 1 MHz (ARINC 453 bus).

Vendor Name	Vendor P/N	Description	QTY	UM
Pic Wire&Cable	D620224	ARINC 453 cable	A/R	EA

Pic Wire&Cable	D5102QX	Hi Temp Quadraxial	A/R	EA
Pic Wire&Cable	D771553	MIL-STD 1553 Data Bus	A/R	EA
ECS	4122021	ARINC 453 cable (2 shields)	A/R	EA
ECS	312402	ARINC 453 cable (3 shields)	A/R	EA
Emteq	D70-022402T-01	ARINC 453 cable	A/R	EA
	M17/176-00002	Military Specification	A/R	EA
	M83536/6-022M	Relay, 4PDT **(Note 1)**	A/R	EA
	M12883/44-01	Relay, Socket **(Note 1)**	A/R	EA

Note 1: Recommended in EFS 40/50 Installation Manual.

1.9.2 GPS Antenna & Cable

The GPS Antenna & cable can be ordered from their manufacturers using the following part numbers:

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Bendix/King	071-01553-0200	KA 92 GPS Antenna (26dB)	1	EA	300-1147-001
Comant	CI 405-2	KA 92 GPS Antenna (26dB)	1	EA	300-1147-001
Bendix/King	050-03318-0000	Antenna Installation Kit	OPT	EA	405-0432-001
Sensor Systems	S67-1575-38	S67 GPS Antenna (29dB)	1	EA	
Sensor Systems	S67-1575-52	S67 GPS Antenna (26dB)	1	EA	
Sensor Systems	S67-1575-133	S67 GPS Antenna (33dB)	1	EA	
Thermax	M17/128-RG400	Coax Cable, RG400/U	A/R	EA	
		Coax Cable, RG-142B/U	A/R	EA	
PIC	S14293	Coax Cable	A/R	EA	
PIC	S44191	Coax Cable	A/R	EA	
ECS	311901	Coax Cable	A/R	EA	
ECS	311601	Coax Cable	A/R	EA	
ECS	311201	Coax Cable	A/R	EA	
Amp	225554-6	TNC Angle Plug, Male	1	EA	440-1239-001
Amphenol	79075	TNC Angle Plug, Male	1	EA	440-1239-001

NOTE: If a satellite communication system is installed in the aircraft, or the GPS cable run is in the vicinity of a VHF transceiver and/or cable, DO NOT USE R/G 142 or R/G 400 cable.

1.9.3 Circuit Breaker

The Circuit Breaker needs to be a 3 Amp delayed action circuit breaker.

Vendor Name	Vendor P/N	Description	QTY	UM
Klixon (T.I.)	7277-2-3	3 Amp Circuit Breaker, EGPWS power +28	1	EA
Klixon (T.I.)	7277-2-1	1 Amp Circuit Breaker, lamp power +28	1	EA

1.9.4 Annunciators & Switch/Annunciators

The devices shown below are West Coast Specialties and Staco switch/annunciators and are representative of those used in some installations. However, there are other comparable devices on the market that may be substituted at the installer/customers choice. **The installer/customer is cautioned to verify regulatory approval of the annunciation devices installed.** See Appendix D for Vendors.

A. **GPWS** (P/TEST); **BELOW G/S** (P/CANCEL) switch/annunciator assemblies

The 'GPWS' annunciator provides visual indication of an EGPWS warning or alert. The GPWS annunciator also has a momentary switch that is used to manually initiate EGPWS Self Test. Two GPWS annunciators are required for each aircraft, one in the direct view of each pilot. If the Lamp Format 2 option is selected (see 3.15.2.1), this switch/annunciator will be labeled 'PULL UP' and annunciated in red.

The 'BELOW G/S' annunciator provides visual indication of an EGPWS glideslope caution. The BELOW G/S annunciator also has a momentary switch that is used to manually inhibit EGPWS Mode 5 glideslope alerts. Two BELOW G/S annunciators are required for each aircraft, one in the direct view of each pilot. If the Lamp Format 2 option is selected (see 3.15.2.1), this switch/annunciator will be labeled 'GPWS' and annunciated in amber.

Vendor Name	Vendor P/N	Description	QTY	UM
West Coast Spec.	90-81401-001	GPWS BELOW G/S	2	EA
West Coast Spec.	90-81401-003	GPWS BELOW G/S	ALT	EA
West Coast Spec.	90-81401-008	GPWS BELOW G/S (1)	ALT	EA
West Coast Spec.	90-81401-009	GPWS BELOW G/S (1)	ALT	EA
STACO	61406-003	GPWS G/S CANCEL	ALT	EA
STACO	61406-004	PULL UP GPWS TEST	ALT	EA
STACO	61406-005	GPWS GPWS TEST	ALT	EA
STACO	61406-006	BELOW G/S G/S CANCEL	ALT	EA

(1) GPWS – BELOW G/S – GPWS FLAP OVRD – G/S CANCLD

B. **GPWS FLAP OVRD**; **GPWS INOP**; **G/S CANCLD** switch/annunciator assemblies

The 'GPWS FLAP OVRD' annunciator provides visual indication that the EGPWS Flap Override function is activated. The GPWS FLAP OVRD annunciator also has a momentary switch that is used to manually activate the Flap Override function.

The 'GPWS INOP' annunciator provides visual indication that the EGPWS' GPWS modes have been disabled or do not function because of an external or internal fault.

The 'G/S CANCLD' annunciator provides visual indication that the EGPWS Mode 5 function is inhibited.

Vendor Name	Vendor P/N	Description	QTY	UM
West Coast Spec.	90-81401-008	(1)	1	EA
West Coast Spec.	90-81401-009	(2)	1	EA
West Coast Spec.	90-81401-010	(3)	1	EA

West Coast Spec.	90-81401-011	(4)	1	EA
West Coast Spec.	90-81401-012	(5)	1	EA
STACO	61406-007	GPWS FLAP OVERRIDE	1	EA

(1) GPWS – BELOW G/S – GPWS FLAP OVRD – G/S CANCLD
(2) GPWS – BELOW G/S – GPWS FLAP OVRD – GPWS INOP
(3) GPWS FLAP OVRD – G/S CANCLD
(4) GPWS INOP – G/S CANCLD – GPWS FLAP OVRD
(5) GPWS FLAP OVRD – GPWS INOP

C. **TERR DISPLAY**; **TERR INHIBIT**; **GPWS FAIL / TERR FAIL** switch/annunciator assemblies

The 'TERR DISPLAY' annunciator provides visual indication that the EGPWS Terrain Display has been selected for the associated display. The TERR DISPLAY annunciator also has a momentary switch that is used to manually select the Terrain Display.

The 'TERR INHIBIT' annunciator provides visual indication that the EGPWS Terrain functions have been inhibited. The TERR INHIBIT annunciator also has a alternate action switch that is used to manually inhibit the Terrain functions.

The 'GPWS FAIL / TERR FAIL' annunciator provides visual indication that the EGPWS GPWS modes or TA&D and TCF modes have a disabled function.

Vendor Name	Vendor P/N	Description	QTY	UM
STACO	61406-001	TERRAIN DISPLAY ON	1	EA
STACO	61406-002	TERR INHIBIT ON	1	EA
STACO	61406-011	GPWS FAIL TERRAIN FAIL	1	EA

1.9.5 Cockpit Speakers

The MK VI / MK VIII EGPWS can interface to an 8 ohm audio speaker for cockpit annunciation of aural alerts.

Vendor Name	Vendor P/N	Description	QTY	UM
Quam	30A05Z8	Audio Speaker	1	EA
Utah	SP-3A	Audio Speaker	1	EA

1.9.6 Temperature Probes

The MK VI / MK VIII EGPWS may be optionally interfaced to a dedicated 500-ohm temperature probe meeting the specifications of ARINC 575 Section 3.8. The installer may want to discuss availability of a dual-element probe compatible with the EGPWS and with other systems on the aircraft with the manufacturers.

Vendor Name	Vendor P/N	Description	QTY	UM
CIC	05257	Single element, unheated	1	EA
Norwich	103-00157-3	Single element, unheated	1	EA
Norwich	103-00034	Dual element, unheated	1	EA
Rosemount	102CT2CB	500-ohm	1	EA
Rosemount	102AU1AF	Single element, heated	1	EA
Rosemount	102AU1AG	Dual element, heated	1	EA

Rosemount	102EH2BH	Dual element, heated	1	EA
Rosemount	102EH2EB	Dual element, heated	1	EA
Rosemount	102JE2FG	Triple element, heated	1	EA
Rosemount	129H-500	Single element, unheated	1	EA
Rosemount	129G-500	Dual element, unheated	1	EA

1.10 Tools Required

1.10.1 Crimping Tool - P1, P2, P3

Description	UM	QTY	Vendor Name & Part Number	
Hand Crimping Tool	EA	1	Positronic Ind.	9507
Hand Crimping Tool	EA	1	Daniels	AFM8
Hand Crimping Tool	EA	1	Military	M22520/2-1
Hand Crimping Tool	EA	1	Astro	61517

1.10.2 Contact Positioner - P1, P2, P3

Description	UM	QTY	Vendor Name & Part Number	
Contact Positioner, Socket P1	EA	1	Positronic Ind.	9502-3
Contact Positioner, Socket P1	EA	1	Daniels	K41 (for 22 to 28 AWG)
Contact Positioner, Socket P1	EA	1	Military	M22520/2-06
Contact Positioner, Socket P2	EA	1	Positronic Ind.	9502-5
Contact Positioner, Socket P2	EA	1	Daniels	K13-1 (20-24 AWG)
Contact Positioner, Socket P2	EA	1	Military	M22520/2-08
Contact Positioner, Pin P3	EA	1	Positronics	9502-4
Contact Positioner, Pin P3	EA	1	Daniles	K42 (22-28 AWG)
Contact Positioner, Pin P3	EA	1	Military	M22520/2-09

1.10.3 Insertion/Removal Tool - P1, P2, P3

Description	UM	QTY	Vendor Name & Part Number	
Removal Tool P1, P3	EA	1	Daniels	DRK 95-22M
Removal Tool P1, P3	EA	1	Military	M81969/8-02
Removal Tool P2	EA	1	Daniels	DRK145
Insertion Tool P1, P3	EA	1	Daniels	DAK 95-22M
Insertion Tool P1, P3	EA	1	Military	M81969/8-01
Insertion Tool P2	EA	1	Daniels	DAK145
Insertion/Removal Tool P1, P3	EA	1	Military	M81969/1-04
Insertion/Removal Tool P2	EA	1	Military	M81969/1-02

1.10.4 Spare Connectors and Contacts - P1, P2, P3

P/N	Description	UM	QTY	Vendor Name & Part Number
440-1223-002	15 pin male with hood	EA	1	Positronic Ind. DD15M10YOC-15
440-1223-003 [1]	15 pin female	EA	1	Positronic Ind. DD15F10OOC-15
440-1223-004 [1]	15 pin male	EA	1	Positronic Ind. DD15M10OOC-15
400-5163-002 [1]	15 pin clamp kit	EA	1	AMP 745854-3
male contacts for 15 pin 22-30 AWG		EA	1	Positronic Ind. MC8022D
male contacts for 15 pin 22-30 AWG		EA	1	M39029/58-360
female contacts for 50 pin 20-24 AWG		EA	1	Positronic Ind. FC6020D
female contacts for 50 pin 20-24 AWG		EA	1	M39029/63-368
female contacts for 78 pin 22-30 AWG		EA	1	Positronic Ind. FC8022D
female contacts for 78 pin 22-30 AWG		EA	1	M39029/57-354

[1] These parts are available in EGPWS kit PN 755-7013-090.

1.11 License Requirements

There are no Radio license requirements for the MK VI/MK VIII EGPWS

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SECTION II

INSTALLATION

SECTION II - INSTALLATION 29

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SECTION II - INSTALLATION

2.1 Introduction

This section contains suggestions and factors to consider before installing the Enhanced Ground Proximity Warning System. Close adherence to these suggestions will assure satisfactory performance from the equipment.

NOTE

The conditions and tests performed on this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within these performance standards. The article may be installed only if further evaluation by the applicant documents an acceptable installation and is approved by the airworthiness authority.

2.2 Unpacking and Inspecting the Equipment

Exercise extreme caution when unpacking equipment. Perform a visual inspection of the unit for evidence of damage incurred during shipment. If a damage claim must be filed, save the shipping container and all packing materials to substantiate your claim. The claim should be filed as soon as possible. The shipping container and all packing materials should be retained in the event that storage or reshipment of the equipment is necessary.

2.3 Equipment Installation

2.3.1 General

The following paragraphs contain information pertaining to the installation of the MK VI and MK VIII EGPWS, including instructions concerning the location and mounting of the equipment. The equipment should be installed in the aircraft in a manner consistent with acceptable workmanship and engineering practices, and in accordance with the instructions set forth in this publication. To ensure the system has been properly and safely installed in the aircraft, the installer should make a thorough visual inspection and conduct an overall operational check of the system, on the ground, prior to flight.

CAUTION

AFTER INSTALLATION OF THE CABLING AND BEFORE INSTALLATION OF THE EQUIPMENT, A CHECK SHOULD BE MADE WITH THE AIRCRAFT PRIMARY POWER SUPPLIED TO THE MOUNTING CONNECTOR, TO ENSURE THAT POWER IS APPLIED ONLY TO THE PINS SPECIFIED IN THE INTERWIRING DIAGRAMS IN SECTION III.

2.3.2 MK VI/MK VIII Computer Location

Care should be exercised to avoid mounting components near equipment operating with high pulse current or high power outputs such as radar and satellite communications equipment. In general, the equipment should be

installed in a location convenient for operation, inspection, and maintenance, and in an area free from excessive vibration, heat, and noise generating sources.

The MK VI and MK VIII EGPWS have an internal heater blanket therefore they can be mounted outside the heated area of the aircraft. The computers have been qualified for operation up to 50,000 feet and -55°C using the heater blanket.

All mechanical installation drawings, connector assembly diagrams, interwiring diagrams, and connector pin assignment tables referenced in this section are located at the end of Section II of this manual. Determine the mounting location for the system components following the guidelines below.

Prior to installing any equipment, make a continuity check of all wires and cables associated with the system. Then apply power and check for proper voltages at system connectors, and then remove power before completing the installation.

To allow for inspection or repair of the wiring of the connector assembly itself, sufficient lead length should be left so that EGPWS may be moved several inches. A bend should be made in the harness to allow water droplets that might form on the harness due to condensation, to drip off at the bend and not collect in the connector.

NOTE

For retrofit installations of classic MK VI GPWS and installing a EGPWS with internal GPS, the connector backshell of the classic MK VI P1 connector will interfere with the GPS antenna connector on the front of the EGPWS. The connector backshells chosen for the EGPWS kits now extends straight out and does not interfere with the GPS antenna connector.

The length of cables from the EGPWS connectors to other system units is not generally critical because unit interfaces are designed with high impedance inputs, low impedance outputs, and low noise susceptibility characteristics. The exception is the wires from the EGPWS Configuration Module, which was designed to be a part of the EGPWS connector backshell because of the requirement for short lead length. Follow aircraft manufacturer's, sub-system manufacturer's or ARINC specifications for shield grounding.

2.3.3 MK VI/ MK VIII Computer Installation

The MK VI and MK VIII EGPWS installation will conform to standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installation. However, the following suggestions will assure a more satisfactory performance from the equipment.

A. Plan a location on the aircraft so that the EGPWS is accessible for front panel maintenance controls. Check to be sure that there is adequate space in the front of the computer for connectors and cabling.

B. Refer to Figure 2-2 and 2-3 for outline dimensions of the computer and mounting tray.

C. Mount the EGPWS mounting tray in the aircraft radio rack or other location using the four screw mounting holes. Match drill the mounting holes using the Mounting Tray as a template.

D. Ensure that the mounting tray is electrically bonded (less than 10 milli-ohm to aircraft ground).

E. Slide the EGPWS unit in the mounting tray, and secure it using the Hold Down latch.

F. (After Continuity and Power check) Attach the cable harness to the front panel connectors and lock connectors using the slide lock of the P1 & P2 connectors. The EGPWS should be wired according to the interconnect diagrams in Section III, of this manual.

2.3.4 Configuration Module Location

The aircraft configuration is programmed into the EGPWS Configuration Module installed in the aircraft wiring. The Configuration Module is identified as Honeywell part number 700-1710-020 (optional part number 700-1710-001). The Configuration Module is installed as one side of the P2 (50 pin) mating connector backshell and contains electrically reprogrammable memory for configuration storage. The Configuration Module when installed is wired directly to the appropriate pins in the P2 connector.

2.3.5 Configuration Module Installation

The purpose of this procedure is to give an assembly sequence for assembly of the Configuration Module with the P2 connector and backshell.

A. The P2 connector, Honeywell part number 440-1233-001, vendor part number RD50F1OJVLC-15, when ordered comes with 50 contacts and a plastic backshell (hood).

B. The Configuration Module will replace the Backshell Plate. The Backshell Plate can be discarded.

C. Wire the Configuration Module to the P2 connector using contacts provided with the connector. Wire per the following wire list:

Wire Color	P2 pin #
Violet	P2-17
Blue	P2-16
Orange	P2-33
Black	P2-50
White	P2-49
Red	P2-32

D. Position Slide Lock and Spring Clip onto connector.

E. Install Backshell Housing onto connector. The Ground wire (used for ESD discharge) is terminated with shielded pigtails inside the backshell to the P2 connector.

F. Organize and dress wire exiting from the backshell, route Configuration Module wires in a coil. Install Cable Clamp, do not tighten Cable Clamp screws.

G. Secure the Configuration Module to the connector using screws provided. Tighten Cable Clamp screws as required.

CONFIGURATION MODULE ASSEMBLY

REQUIRED: Two items as follows:

1.0	Connector (P2)	Positronic Ind.	RD50F10JVLC-15 *
2.0	Configuration Module	Honeywell	700-1710-020

* This item may be available from Honeywell under Part No. (440-1233-001)

ITEM 2 DESCRIPTION:

Connector P2 (Positronic Ind. PN RD50F10JVLC-15) is a packaged kit consisting of the following parts:

1.1	Connector, 50 socket D-Sub	Qty - 1
1.2	Contacts, size 20 crimp	Qty - 50
1.3	Backshell housing	Qty - 1
1.4	Backshell plate	Qty - 1
1.5	Screws, Phillips CSK	Qty - 2
1.6	Spring Clip	Qty - 1
1.7	Slide Lock	Qty - 1
1.8	Screws, Slotted	Qty - 2
1.9	Cable Clamp	Qty - 1

INSTALLATION ASSEMBLY SEQUENCE

STEP 1 Install all MK VI/MK VIII system aircraft wiring to this connector using items 1.2 (Crimp Contacts) and item 1.1 (Connector). See figure 2.1-1 below.

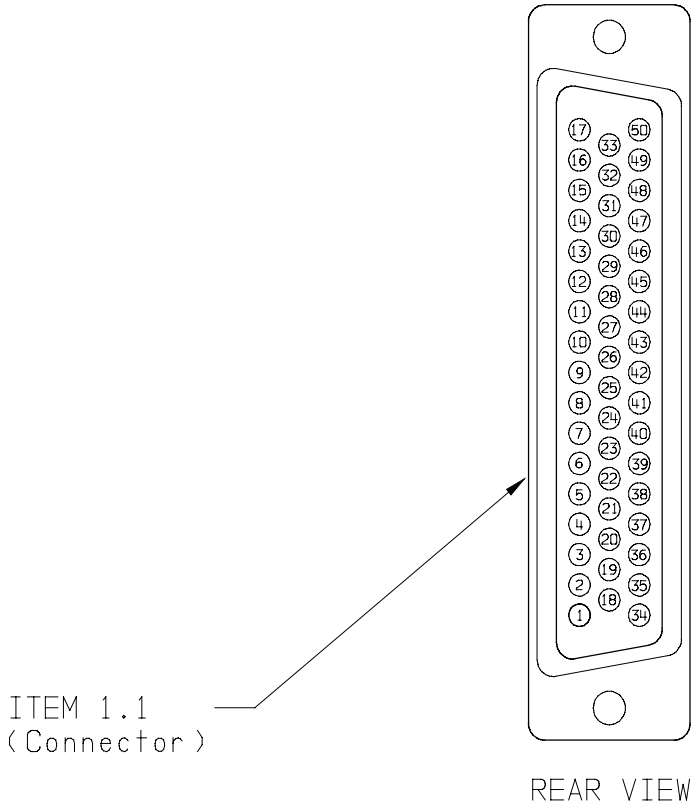


FIGURE 2.1-1 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 2 Wire item 2.0 (Configuration Module). This part will replace item 1.4 (Backshell plate). Install the pre-crimped colored wires into item 1.1 (Connector) as shown in figure 2.1-2 below.

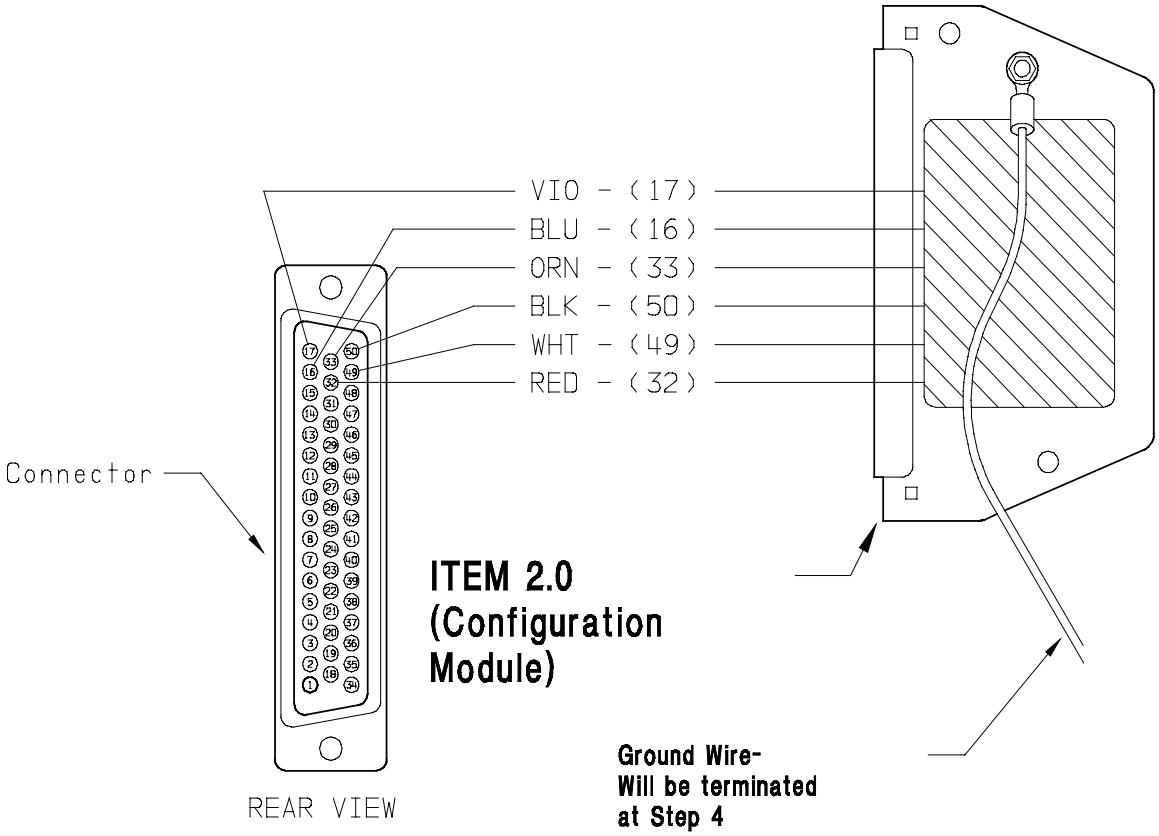


FIGURE 2.1-2 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 3 Position item 1.7 (Slide lock) onto wired connector as shown in figure 2.1-3 below:

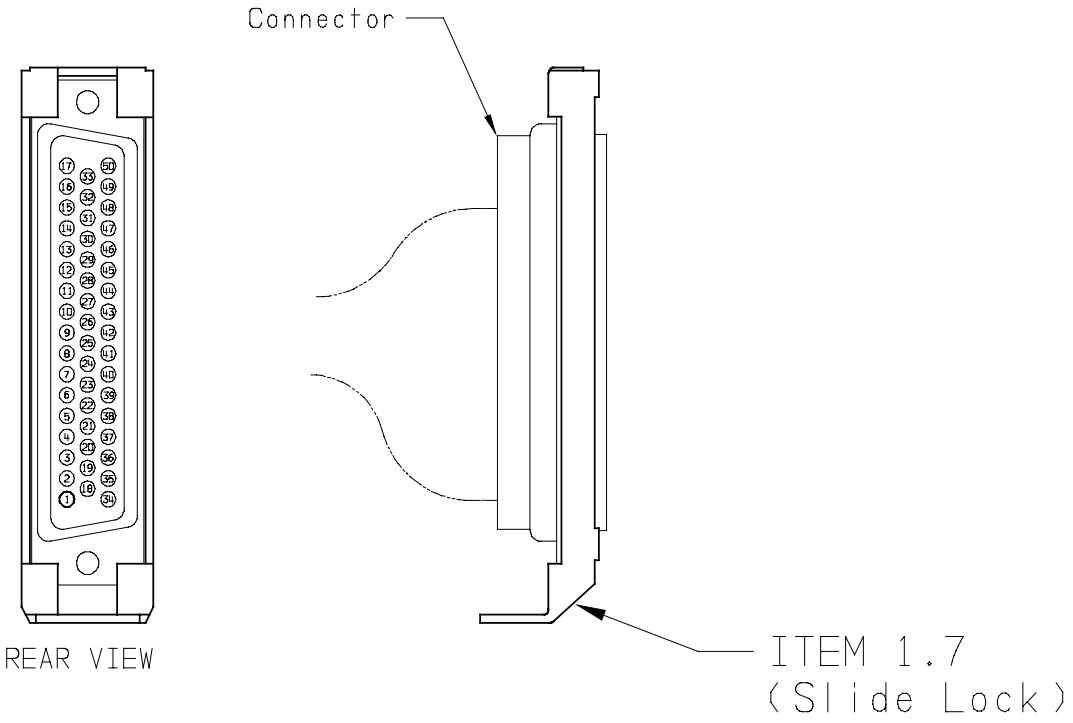


FIGURE 2.1-3 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 4 Install item 1.3 (Backshell Housing) onto connector using item 1.8 (Screws) as shown in figure 2.1-4 below:

Ground Wire (used for electrostatic discharge {ESD} protection) is terminated with shielded pigtails of wires at this connector.

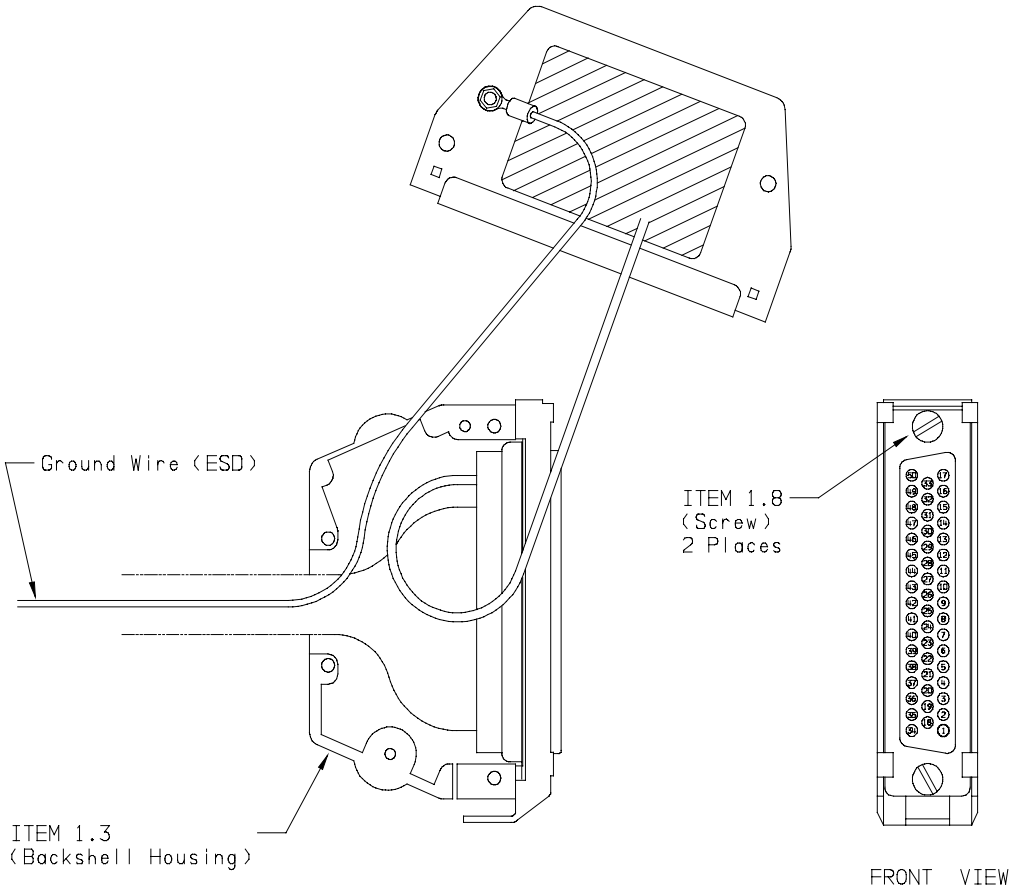


FIGURE 2.1-4 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 5 Install item 1.6 (Spring Clip) as shown figure 2.1-5 below:

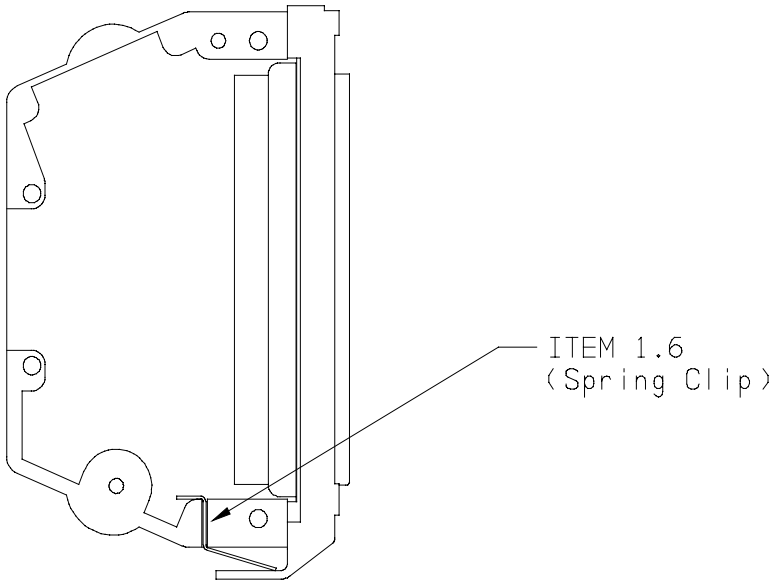


FIGURE 2.1-5 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 6 Organize and dress wiring exiting from backshell. Route Configuration Module wires exiting from connector, then coil as shown in figure 2.1-6 below. Install item 1.9 (Cable Clamp) as shown. Do not tighten screws yet.

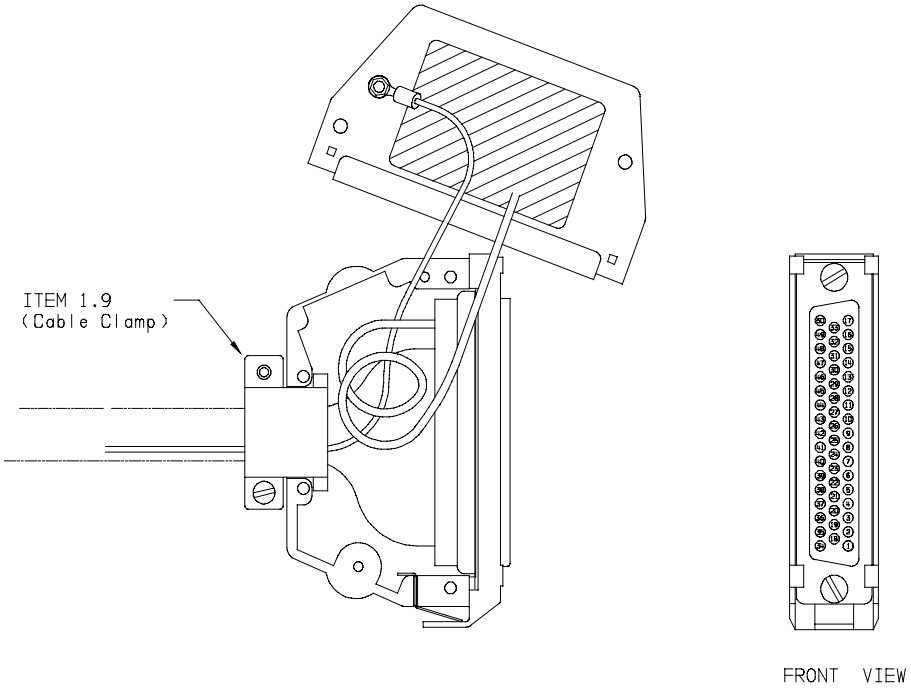


FIGURE 2.1-6 MK VI/MK VIII EGPWS CONFIGURATION MODULE

STEP 7 Secure Configuration Module to connector assembly using item 1.5 (Screws) as shown in figure 2.1-7 below. Tighten Cable Clamp screws as required.

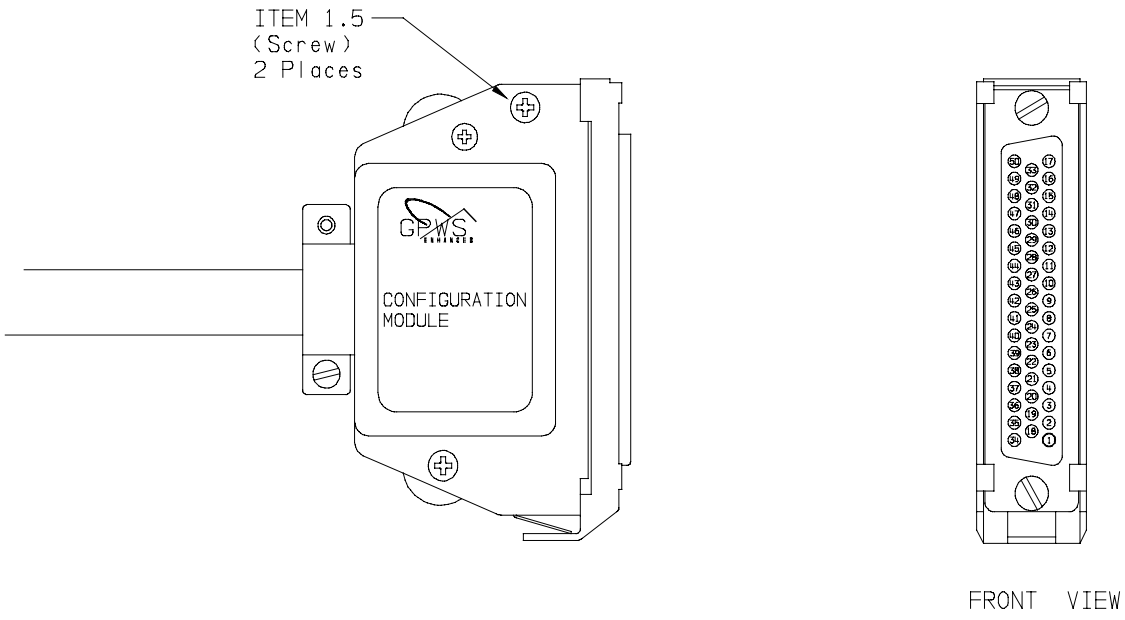


FIGURE 2.1-7 MK VI/MK VIII EGPWS CONFIGURATION MODULE

2.3.6 GPS Antenna location

The GPS antenna should be mounted on top of the fuselage in the centerline of the aircraft. Avoid mounting the antenna near any projections, the propeller, and the T-tail of the aircraft, where shadows could occur. It is recommended that there be a separation of at least 3 feet between the GPS antenna and any VHF Comm antenna on the aircraft. The GPS antenna baseplate must be level within ± 5° in both axis when the aircraft is level (level is defined as the aircraft attitude required when weighing the aircraft for weight and balance). If the GPS antenna is tilted more than 5° or is mounted close to other objects that shadow it, loss of some of the satellites will occur and system performance degraded. See manufacturer for specifications of GPS antennas. Some GPS Antenna cable and connector information, including vendor information, is listed below.

Cable Length	Cable Part Number (VPN)	EGPWS TNC Connector (VPN)	Antenna TNC Connector (VPN)	Max Loss*
0 to 40 ft	RG142B/U RG400/U	TED Mfg. 5-10-30	TED Mfg. 5-30-102-1	8.0
0 to 80 ft	ECS 311601	TED Mfg. 5-10-307	TED Mfg. 5-10-307	8.0
0 to 100 ft	ECS 311201	TED Mfg. 5-10-306	TED Mfg. 5-10-306	8.0
100 to 165 ft	Contact TED, ECS or PIC for complete cable/connector assembly			

* Maximum Allowable Loss (dB) @ 1575 MHz for cable and connector using nominal 26.5 dB gain.

TED Manufacturing Corp.
11415 Johnson Drive
Shawnee, Kansas 66203
Tel: (913) 631-6211

Electronic Cable Specialists (ECS)
5300 W. Franklin drive
Franklin, Wisconsin 53132
Tel: (800) 327-9473

PIC Wire & Cable
N63 W 22619 Main Street
Sussex, Wisconsin 53089
Tel: (800) 742-3191

2.3.7 GPS Antenna Installation

Refer to manufacturer's procedures or applicable STC documentation.

2.3.8 OAT Sensor Location

The OAT sensor should be mounted on the underside (belly) of the aircraft or other convenient location meeting the following conditions. Avoid mounting the sensor where it can be affected by direct sunlight, or exhaust gases from engines or heaters. The probe tip should extend beyond the aircraft boundary layer into the turbulent airflow. See manufacturer for specifications.

2.3.9 OAT Sensor Installation

Refer to manufacturer's procedures or applicable STC documentation.

2.3.10 Cockpit Lights

This section provides information for selecting, locating and mounting of the MK VI and MK VIII EGPWS Cockpit lights. **NOTE:** The nomenclature given for each lamp is an example only. Other manufacturers use nomenclature that is also acceptable.

NOTE: All lights

1. Refer to Honeywell Product Specification 965-1176-601 for additional information and for electrical loads specification.
2. All lights are +28 VDC, dual bulb, sun light readable, non-flashing.
3. In the “OFF” condition, all lights have dark background with visible nomenclature for action.
4. If desired the lights may be put on a “dimmer” circuit for night operation.

2.3.10.1 Description

EGPWS alert/warning (Lamp Format 1) **GPWS** **P/TEST**

This assembly is illuminated with red background and activated during any Mode 1 through Mode 4, and Terrain Awareness alert or warning. This assembly also includes a momentary switch that will activate EGPWS Self Test.

EGPWS warning (Lamp Format 2) **PULLUP P/TEST**

This assembly is illuminated with red background and activated during any Mode 1, Mode 2, or Terrain Awareness PullUp warning. This assembly also includes a momentary switch that will activate EGPWS Self Test.

GLIDESLOPE alert (Lamp Format 1) **BELOW G/S** **P/CANCEL**

This assembly is illuminated with amber background and activated during any Mode 5 alert. This assembly also includes a momentary switch that will de-activate (cancel) EGPWS Mode 5 alerts during backcourse or low altitude approaches.

EGPWS caution (Lamp Format 2) **GPWS** **G/S CANCEL**

This assembly is illuminated with amber background and activated during any EGPWS alert (non-Pullup). This assembly also includes a momentary switch that will de-activate (cancel) EGPWS Mode 5 alerts during backcourse or low altitude approaches.

Glideslope Canceled **G/S CANCLD** (optional but recommended)

This assembly is illuminated with white, blue or amber background and activated after the flight crew has initiated the manual cancel of Mode 5 by pressing the BELOW G/S – P/CANCEL light/switch described above.

EGPWS Flap Override **GPWS FLAP OVRD** (optional but recommended)

This guarded light/switch assembly is illuminated with blue background and activated after the flight crew has initiated the manual selection of the GPWS Flap Override feature. This assembly also includes a momentary switch that will activate GPWS Flap Override. Note: the light color may also be white background with black legend or black background with white legend. Colors are per FAR 23.1322.

GPWS system validity **GPWS INOP**

This assembly is illuminated with amber background and activated during any detected partial or total failure of the GPWS modes 1-5.

TERRAIN select **TERR DISPLAY** **ON**

This assembly is illuminated with white background and activated after the flight crew has initiated the manual selection of the EGPWS terrain display for the associated cockpit display. This assembly also includes a momentary switch that will activate EGPWS Terrain display feature.

TERRAIN inhibit **TERR INHIBIT ON**

This assembly is illuminated with amber background and activated after the flight crew has initiated the manual inhibit of the EGPWS Terrain Awareness & display and Terrain Clearance Floor functions during an approach to an airport not in the EGPWS Terrain/Runway database. This assembly also includes a alternate action switch that will inhibit EGPWS TA&D and TCF functions.

TERRAIN system validity **TERR FAIL**

This assembly is illuminated with amber background and activated during any detected partial or total failure of the TA&D or TCF functions.

2.3.10.2 Location

Cockpit layout, size and operator's preference will determine if only one set of lights is used (i.e., mounted in the center), or if dual sets of lights are used (one set on each side), or a combination thereof is desired. For a typical example of cockpit light locations refer to Figure 2-3. For panel cutouts and assembly options see the manufacturer's specifications. The following are recommended locations:

GPWS & **BELOW G/S** **or** **PULLUP & GPWS**

These lights should be located together and in the flight crew's "primary field of view". This would include either the instrument panel or the edge of the glareshield.

GPWS FLAP OVRD -Optional-

This light should be located in the flight crew's "field of view" and within reach of both crew members. This light/switch may be located in an assembly with the GPWS and BELOW G/S lights and/or other EGPWS annunciators.

GPWS CANCLD -Optional-

If used, this light should be located within at least one crew member's "field of view".

GPWS INOP

This light should be located within at least one crew member's "field of view" or with other system INOP lights of similar importance. It is recommended that this light not be located in the flight crew's "primary field of view". The reason being that in the event of a GPWS system failure at the beginning of a flight, this light will remain "ON" until the problem is fixed. This light may be combined with the TERR FAIL light.

TERR DISPLAY ON

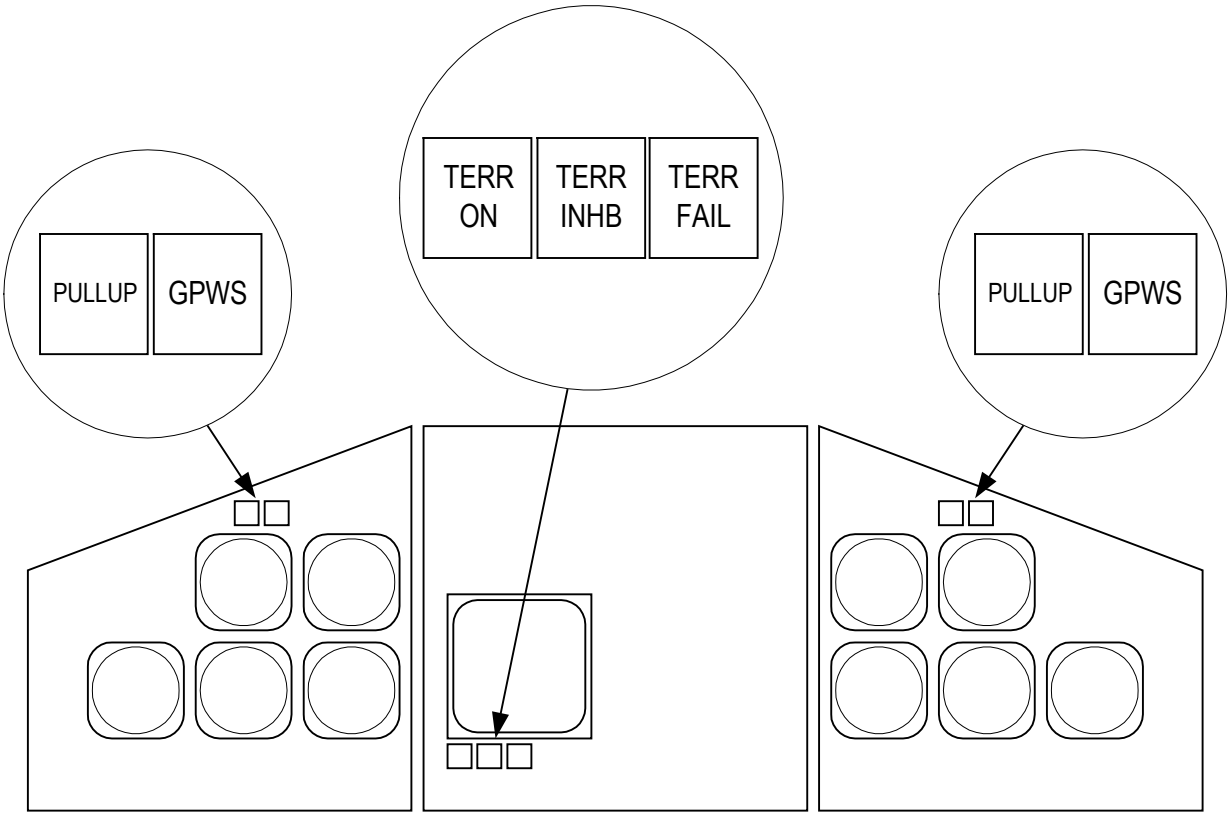
This light should be located near the associated cockpit display, in the flight crew's "field of view" and within reach of one or both crew members. This light/switch may be located in an assembly with the TERR INHIBIT light(s) and/or other EGPWS annunciators.

TERR INHIBIT ON

This light should be located in the flight crew's "field of view" and within reach of both crew members. This light/switch may be located in an assembly with the TERR DISPLAY light(s) and/or other EGPWS annunciators.

TERR FAIL

This light should be located within at least one crew member's "field of view" or with other system INOP lights of similar importance. Note: Annunciators are available with split legend GPWS FAIL / TERR FAIL in one assembly. It is recommended that this light not be located in the flight crew's "primary field of view". The reason being that in the event of a GPWS system failure at the beginning of a flight, this light will remain "ON" until the problem is fixed.



The above picture is an example of lamp location and does not restrict lamp location or format

Figure 2.3

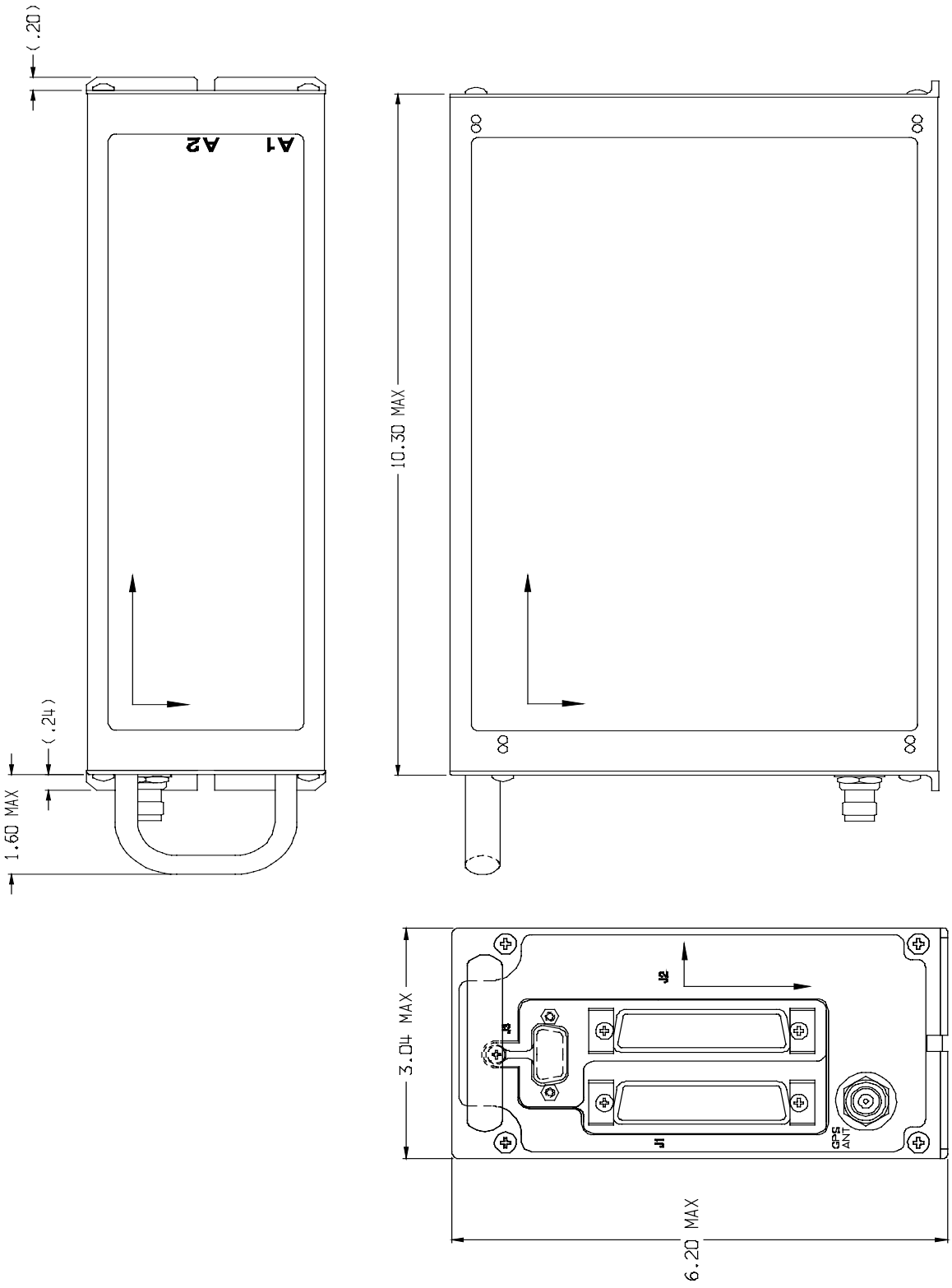


FIGURE 2-2 MK VI/MK VIII EGPWS OUTLINE

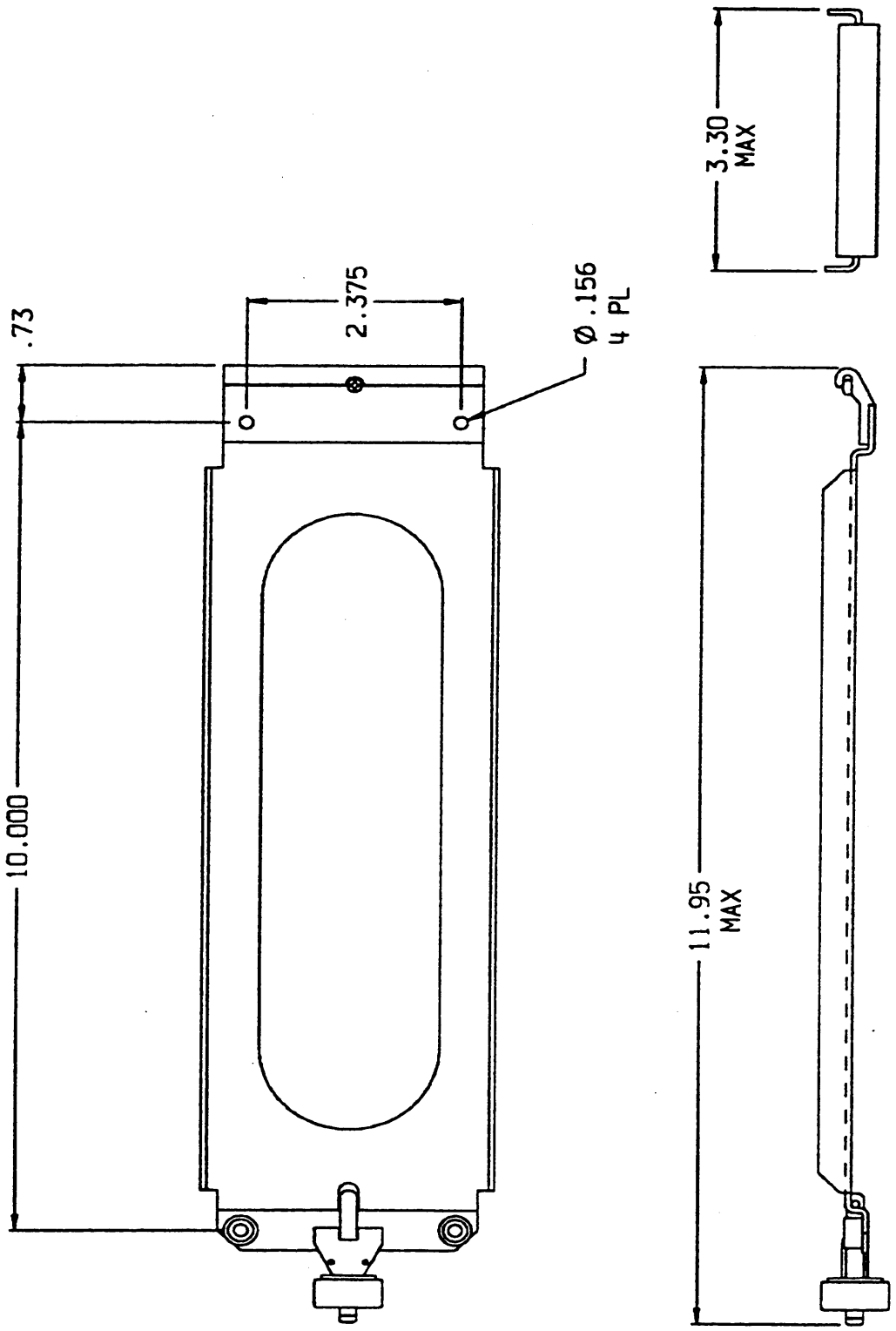


FIGURE 2-3 MK VI/MK VIII EGPWS MOUNTING TRAY

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SYSTEM PLANNING

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SECTION III – SYSTEM PLANNING

3.1 Introduction

This section provides information for selecting features and wiring the electrical interfaces of the MK VI/MK VIII EGPWS.

Appendix E Section 5.2 groups features (functions) into sets called Categories. This document follows the Category structure of the Appendix E. It provides descriptions of the features and instructions for selecting features and for determining the correct wiring.

Sample wiring diagrams for the most commonly used MK VI/MK VIII EGPWS configurations are provided in Appendix B.

Make copies of Appendix E Table 5-2 to use for recording feature selections.

Section 6 provides a cross-reference between the MK VI GPWS (Classic) and the MK VI/MK VIII EGPWS (Enhanced) interfaces.

3.2 System Wiring/ Electrical Interfaces

System wiring is broken down into the following main components:

- Electrical Interfaces (power and ground)
- GPS Antenna
- Analog and Digital Inputs
- Discrete Inputs
- Serial Outputs
- Audio Outputs
- Discrete Outputs
- Configuration Module

Many of these inputs and outputs will be defined as the Categories are selected for Configuration Module programming. Appendix E Table 8.1-1 shows the typical usage for each pin on the Left (J1), Right (J2) and Upper (J3) connectors and provides a place for recording the actual usage for this installation.

3.2.1 Primary Power Input

The MK VI/VIII EGPWC requires a primary power input (28 VDC input power) and ground. The Primary power should be connected as follows for the MK VI/VIII EGPWC.

Pin	Signal
J1-40, J1-60 *	+28 VDC Input
J1-41, J1-61 *	+28 VDC Return

*Pin pairs J1-40/J1-60 and J1-41/J1-61 are internally shorted to each other.

Recommended EGPWC Power Control Device: 3 Amp Delayed Action Circuit Breaker

3.2.2 Chassis Ground

Chassis ground provides a redundant metal connection and should not be used as a normal current carrying conductor. Chassis ground should be connected as follows:

Pin	Signal
J1-42, J1-53	GND

Pins J1-42 and J1-53 are both connected to chassis ground internally. It is not necessary to tie them both to ground in the aircraft wiring. Pin J1-53 was made available to provide a convenient way to supply a ground to external equipment. If the OAT probe is not present, nothing needs to be tied to J1-53.

3.2.3 GPS Antenna

A GPS antenna connector is available on the front of the MK VI EGPWS 965-1190-0XX and MK VIII EGPWS 965-1220-0XX. See Appendix E paragraphs 3.2.2 and 4.2.9 for connector details. The J1 connector backshell supplied with classic MK VI GPWS installation kits can interfere with the GPS antenna connector for this reason a new J1 backshell is supplied with MK VI-VIII installation kits.

3.2.4 Analog and Digital Inputs

The analog and digital inputs to the MK VI/VIII EGPWS are defined as the Categories are selected. Instructions for documenting these interfaces are provided with the Category selection instructions.

3.2.5 Discrete Inputs

The discrete inputs are defined in Appendix E *Section 6.6.* Additional information for some discretes is provided within the Category in which they are used.

3.2.6 Serial Outputs

The EGPWC provides for ARINC 453 and ARINC 429 serial outputs.

Terrain display data is output on two ARINC 453 channels when the Terrain Awareness display function is enabled.

Low speed ARINC 429 output buses are provided by the EGPWC are described in Appendix E *Section 7*. The ARINC 429 output data includes:

1. Internal data (data output for test purposes only such as internal logic booleans, Geometric Altitude, and Terrain Clearance information).
2. Alert/Warning status (Voice and Lamp activity can be provided to display systems and flight recorders).
3. Internal mode status.
4. Terrain display messages for TAD cockpit integration.

Note: During EGPWS Self Test, the SSM of each output label is set to the Functional Test status code.

3.2.7 Audio Output

The audio outputs consist of both an 8-ohm amplifier and a transformer isolated 600-ohm output. Audio output messages are provided as specified in the selected Audio Menu (Category 5) when inputs are valid and the audio inhibit discretes are not active.

When audio inhibit is enabled, the output discrete(s) associated with suppressed message(s) are active.

3.2.8 Discrete Outputs

The MK VI/MK VIII EGPWS provides for up to twelve 0.5 amp nominal (1 amp maximum) Ground/Open discrete outputs. The discrete outputs are defined in Appendix E *Section 4.2.11 and Category 13.*

The discrete outputs are optional if the ARINC 429 output data is used for driving the alert/warning lamps via a symbol generator. Most Aircraft Types do not use the ARINC 429 output data for lamp control. (This data is typically sent to the Flight Data Recorder.)

All outputs to lamps are driven by solid state switches to ground. These outputs can also be used as discrete drivers for other devices (e.g. terrain display switching). **Output discretes are intended to operate with +28 VDC lamp sources and will not operate with +5 VDC lamp sources.**

3.2.9 Configuration Module

The EGPWS aircraft configuration is programmed into a configuration module installed in the aircraft wiring. This Configuration Module is identified as Honeywell part number 700-1710-020. The configuration module is installed as part of the P2 mating connector backshell and contains electrically reprogrammable memory for configuration storage. By this method the aircraft configuration is stored in the configuration module on the aircraft and each newly installed EGPWS computer does not require operator assisted programming before or during installation. The aircraft configuration in the Configuration Module can be changed at any time by use of the WinVIEWS software, as explained in Section 4.

3.3 Category 1 - Aircraft / Mode Type Select

Category 1 specifies the general aircraft type, warning mode differences, bank angle alert curve, fixed or retractable gear, and 3500 ft or 2000 ft min runway length (as an option for MK VIII EGPWS only).

Appendix E *Tables 5.2 and 5.3.1* include some information required by MK VI/MK VIII EGPWS development personnel and not pertinent to the installation design process. Only items relevant to the installation design process are discussed in this document.

3.3.1 Aircraft / Mode Type

The Aircraft Type identifies the aircraft as GA Fast (Turboprop), GA Slow (Turboprop), or Bizjet (Turbofan). The aircraft category defines configurable airspeed limits for mode expansion and gear and flaps stuck down conditions (reasonable test) and also define the Mode 1, 2, 3, 4, & Bank Angle warning/alert curve options.

The MK VI EGPWS only supports aircraft types 0,1,2,3,4 that are designed for turboprop aircraft (and emulate the mode curves of the MK VI GPWS). The MK VIII EGPWS has Aircraft types 254 & 255 that are designed for turbofan aircraft (and emulate the mode curves of the MK V GPWS), along with aircraft types 0,1,2,3,4. Modes 1,2,3,&4 are different between these aircraft types. For reference compare the mode 1-4 turbofan curves to the turboprop curves in the MK VI/VIII EGPWS Product Specification 965-1180-601.

Appendix E Table 5.3.1 lists the combinations of Aircraft/Mode Types, identifies the first MK VI/MK VIII EGPWS version in which the option was available (see the Effectivity entry), and describes the options available with each Aircraft/Mode type (see Description column).

3.3.2 Mode 1 type

Two Mode 1 alert curves are defined, GA (Turboprop) and Bizjet (Turbofan). The lower boundary of the GA Mode 1 curves is 50 feet, the same lower boundary is extended to 10 feet for Bizjet aircraft.

3.3.3 Mode 2 type

Two Mode 2 alert curves are defined, one for GA Fast & Bizjet and one for GA Slow. Mode 2A airspeed expansion increases the Mode 2 expanded alert area linearly from 1650 feet to 2450 feet for airspeeds of 220 knots to 310 knots in GA Fast and Bizjet defined aircraft (same as MK V and MK VII EGPWS). Mode 2 airspeed expansion occurs for airspeeds from 190 knots to 280 knots in GA Slow defined aircraft.

MODE 2 AIRSPEED EXPANSION	
GA FAST (Turboprop)	220 knots to 310 knots
GA SLOW (Turboprop)	190 knots to 280 knots
BIZJET (Turbofan)	220 knots to 310 knots

3.3.4 Mode 3 type

Two Mode 3 alert curves are defined, GA (Turboprop) and Bizjet (Turbofan). The GA (Turboprop) Mode 3 curve is equivalent to the (classic) MK VI Mode 3 curve. The Bizjet (Turbofan) Mode 3 curve is equivalent to the MK V and MK VII EGPWS Mode 3 curves.

3.3.5 Mode 4 type

Mode 4A (Too Low Gear) expanded alert transition occurs at 178 knots for GA Fast aircraft, 148 knots for GA Slow aircraft, and 190 knots for Bizjet aircraft. Mode 4B (Too Low Flaps) upper boundary has four defined levels, 245 ft, 200 ft, 170 ft, and 150 ft. The 245 ft boundary is added to emulate the MK V, VII Mode 4B boundary. The 200 ft boundary is added to emulate the MK II Mode 4B boundary. The 150 ft boundary (Alternate Mode 4B) is for those aircraft types that routinely delay full flap deployment. All other aircraft types would use the 170 ft boundary (Normal Mode 4B). For aircraft with previously installed (classic) MK VI GPWS, the Normal / Alternate Mode 4B correspond to the “Alternate Mode 4B” program pin (J1-25).

The following table compares Mode 4 boundaries for each

Aircraft type / Alternate Mode 4B	Boundaries			Mode 4 A/B Type
	Mode 4A Gear Down at 500 ft, < X knots	Mode 4B Flaps Down feet / < X knots	Mode 4 A/B Maximum	
GA Fast, Normal Mode 4B	178 knots	170 ft / 150 knots	750 ft	6
GA Fast, Alternate Mode 4B	178 knots	150 ft / 148 knots	750 ft	8
GA Slow, Normal Mode 4B	148 knots	170 ft / 120 knots [1]	750 ft	7
GA Slow, Alternate Mode 4B	148 knots	150 ft / 118 knots [1]	750 ft	9
GA Fast, MK II emulation	178 knots	200 ft / 148 knots	1000 ft	5
Bizjet, MK V, VII emulation	190 knots	245 ft / 159 knots	1000 ft	1

NOTE 1: Some installations that have chosen the GA SLOW aircraft type have found during flight test that the aircraft can not (or does not) slow to less than 120 knots on normal approach. Thus the installation is prone to nuisance TOO LOW TERRAIN alerts. These installations should choose the GA FAST aircraft type.

3.3.6 Bank Angle Type

Two Bank Angle callout curves are defined, GA (Turboprop) and Bizjet (Turbofan). Both Bank Angle callout curves have an Autopilot Engaged warning area. The Bizjet (Turbofan) Bank Angle callout curve is equivalent to the MK V and MK VII EGPWS Bank Angle callout curves when the autopilot is not engaged.

Aircraft Type	Lower Cutoff	Lower Boundary	Upper Boundary	Slope
GA (Turboprop)	10 ft	10 ft / 15°	210 ft / 50°	2450 ft / 50°
Bizjet (Turbofan)	5 ft	30 ft / 10°	150 ft / 40°	2450 ft / 55°

3.3.7 Runway Length (MK VIII EGPWS only)

Two minimum runway length options are defined for Bizjet (Turbofan) aircraft. A 2000 ft minimum runway length or a 3500 ft minimum runway length may be chosen based on aircraft type as is identified in Appendix E *Table 5.3.1*. This option does not effect the mode curves as discussed above, and it is only available on MK VIII EGPWS.

3.3.8 Instructions

Using *Appendix E Tables 5.2 and 5.3.1* as described above, select the Aircraft/Mode Type that matches the aircraft configuration, feature preferences and version (part number) being installed.		
Step 1:	Is the aircraft a turbofan?	**YES,** goto Step 2. **NO,** goto Step 3.
Step 2:	Aircraft can operate from runways less than 3500'?	**YES, use ID 255** **NO, use ID 254**
Step 3:	Landing speed is typically > 120 knots?	**YES,** goto Step 4. **NO,** goto Step 5.
Step 4:	200' / 170' / 150' Flap alert preferred?	**200' use ID 2** **170' use ID 0** **150' use ID 1**
Step 5:	170' / 150' Flap alert preferred?	**170' use ID 3** **150' use ID 4**
Record the ID number for the Aircraft/Mode Type from *Appendix E Table 5.3.1* under the Ident No. heading for Step (Category) 1 in *Appendix E Table 5.2.*		

3.4 Category 2 – Air Data Input Select

Category 2 defines the Air Data interface. The Air Data input currently defines 4 analog and 6 digital air data types.

Appendix E Table 5.3.2 defines the Air Data interface options and identifies the first MK VI/MK VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E Tables 5.3.2-x, where x is the Air Data Type number, define the electrical interfaces required to support each Air Data Type.

3.4.1 Analog (Cat. 2 ID 0, 3, 4, 11, 12)

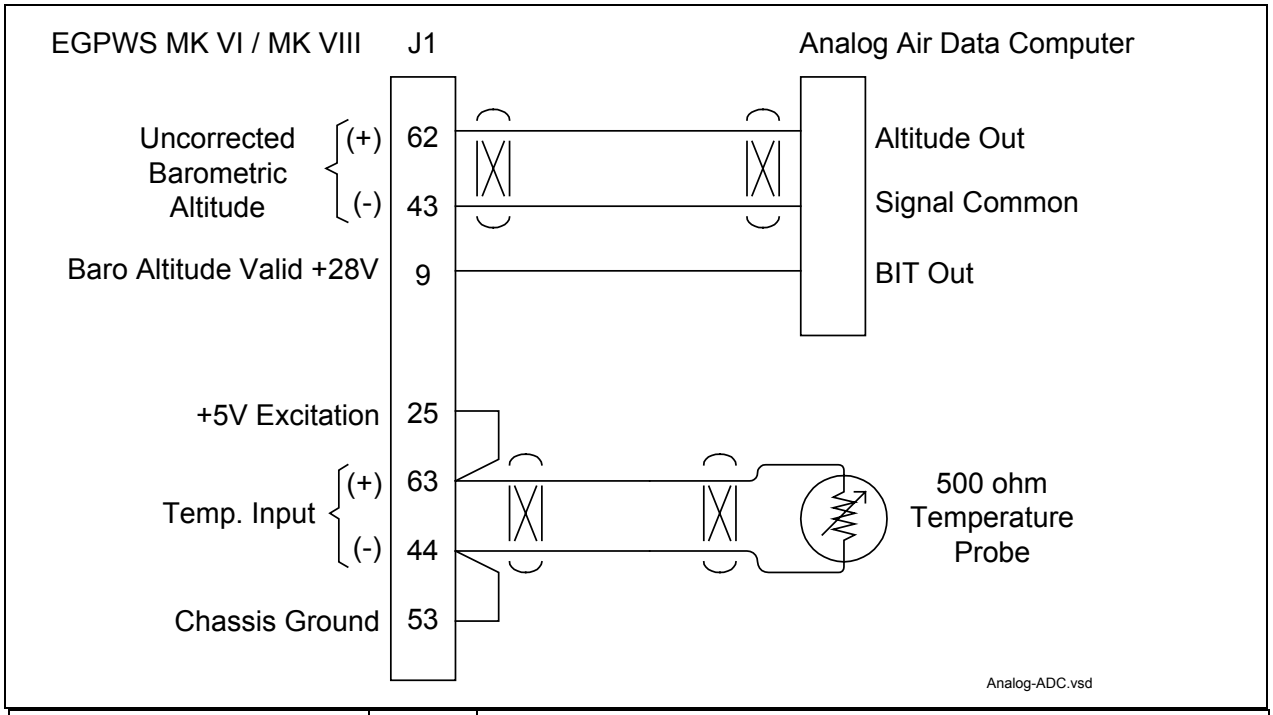
Air Data Type 0 (CIC 04077 or equivalent) uses Uncorrected Barometric Altitude input scaled from –1500 feet (+5 volts) to +30,000 feet (+15 volts) (see Appendix E section 6.1.3). Baro Altitude Rate and Computed Airspeed are not required. Baro Altitude Valid is standard +28 volt discrete. Total Air Temperature is from a dedicated (EGPWS) 500-ohm probe using +5 volt excitation from the MK VI/MK VIII EGPWC.

Air Data Type 3 (ADS-65 or equivalent) uses Uncorrected Barometric Altitude input scaled from -1500 feet (-0.18 volts) to +46,000 feet (+5.52 volts), zero volts equals zero feet (see Appendix E section 6.1.10). Baro Altitude Rate and Computed Airspeed are not required. Baro Altitude Valid is standard +28 volt discrete. Total Air Temperature is from a dedicated (EGPWS) 500-ohm probe using +5 volts excitation from the MK VI/MK VIII EGPWC.

Air Data Type 4 (CIC 02702 or equivalent) uses Uncorrected Barometric Altitude input scaled from -1000 feet (-0.244 volts) to +40,000 feet (+9.756 volts) (see Appendix E section 6.1.14). Baro Altitude Rate and Computed Airspeed are not required. Baro Altitude Valid is standard +28 volt discrete. Total Air Temperature is from a dedicated (EGPWS) 500-ohm probe using +5 volt excitation from the MK VI/MK VIII EGPWC.

Air Data Types 11 and 12 (AZ-241, AZ-242, AZ-800, AZ-810 or equivalent) uses Uncorrected Barometric Altitude input scaled from -3750 feet (0 volts) to +50,000 feet (+10.75 volts) (see Appendix E section 6.1.16). Baro Altitude Rate and Computed Airspeed are not required. Baro Altitude Valid is standard +28 volt discrete. ID 11 requires a dedicated (EGPWS) 500-ohm Total Air Temperature probe using +5 volt excitation from the MK VI/MK VIII EGPWC. ID 12 is configured without a connection to outside air temperature with temperature set not available. As a result, when using ID 12 the EGPWS calculation of Geometric Altitude will be less accurate than using ID 11.

NOTE: The analog air data interface for the MK VI / MK VIII EGPWS uses a dedicated 500-ohm temperature probe. This may be an unused element in a dual element probe but must not be paralleled with any other system. The EGPWS provides the 5 volt excitation for the element.



Vendor Model	Cat 2 ID	Uncorrected Baro Altitude [1]		
		Altitude Out	Common	BIT Out
CIC 04077	0	J1-F	J1-G	J1-E
Collins ADS-65	3	J1-12	J1-13	J1-5
CIC 02702	4	J1-A	J1-B	J1-E
Honeywell AZ-241	11/12[2]	J1A-63	J1A-11 (CGND)	J1A-12
Honeywell AZ-242 [4]	11/12[2]	J1B-17[4]	J1A-11 (CGND)	J1A-12
Honeywell AZ-648	11/12[2]	J1-J	J1-G	J1-U
Honeywell AZ-800[3]	11/12[2]	J1A-78	J1A-10 (CGND)	J1A-34
Honeywell AZ-810[3]	11/12[2]	J1A-78	J1A-10 (CGND)	J1A-34
Honeywell AZ-252	11/12[2]	J1A-17	J1A-10 (CGND)	J1A-34

NOTES:

1 The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

2 ID 12 does not require an OAT input, instead a constant temperature of 25 deg C is assumed.

3 Honeywell AZ-810 should only be used as an analog source if it does not have a digital interface.

4 Honeywell AZ-242 with part numbers 4013242-708, -709, -710, -712, -713 and –742 have DC Altitude out at pin J1B-17. Part numbers 4013242-709 and -711 have DC Altitude out at pin J1A-40.

3.4.2 Digital – ARINC 429 (Cat. 2 ID 5, 1, 6, 13)

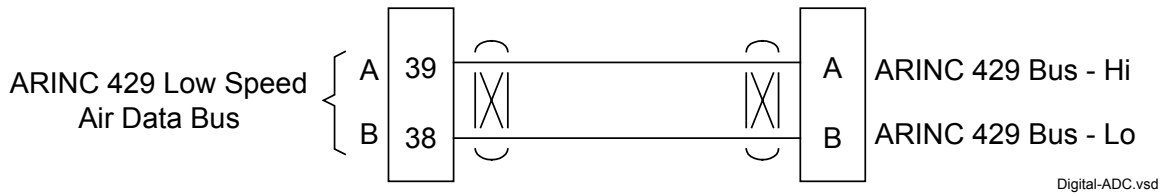
Air Data Type 1 is a low speed, digital ARINC 429 signal having the air data labels 203, 206, 212, and 213.

Air Data Type 5 is a low speed, digital ARINC 429 signal having the air data labels 203, 204, 206, 212, and 213.

Air Data Type 6 is a low speed, digital ARINC 429 signal having the air data labels 203, 206, and 213.

Air Data Type 13 is a low speed, digital ARINC 429 signal having the air data label 203 only.

If the hardware is capable of transmitting all label sets, the preferred Air Data Type is 5. If only label 204 is missing, use Air Data Type 1, and if both labels 204 and 212 are missing use Air Data Type 6. Some aircraft have only label 203 available (or no temperature) for those choose Air Data Type 13.



Vendor Model	Cat 2 ID	Bus 1		Bus 2	
		A	B	A	B
Honeywell AZ-6XX, AZ-8XX	5*	J1B-26	J1B-27	J1B-70	J1B-71
CIC 04471	5*	J1-12	J1-13		
CIC 02702 mod 6	*	J2-J	J2-K		
KDC 281	*	P2811-5	P2811-6		
KDC 481	*	P4811-U	P4811- i		
B&D 90004	5*	J1-27	J1-9		
B&D 2600	6**	6	8		
B&D 2601	6**	14	13		
B&D 2800	*	P201-11	P201-28		
Collins ADC 85/86	5*	P2-9	P2-10	P2-29	P2-30
Shadin ADC-2000 (s/w mod 71.73.01)	5*	J1-40	J1-22		

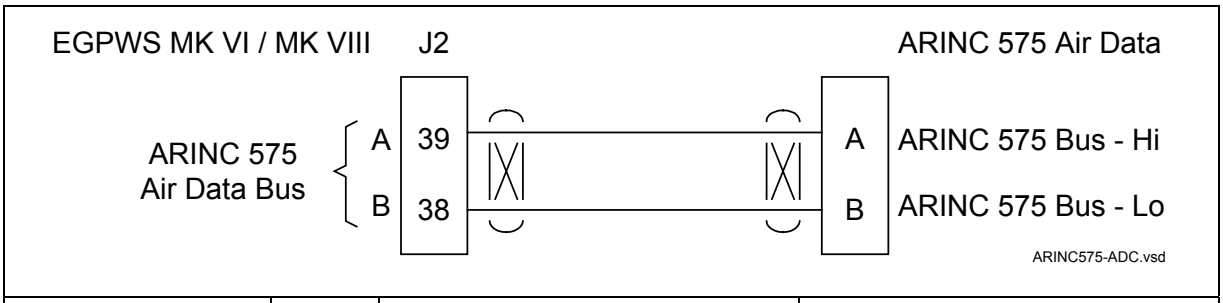
NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

* Category 2, ID 5, 1, 6 or 13 depending on availability of labels 204 and 212. ID 5 is the preferred selection, then ID's 1, 6, and 13 in order of preference. CIC air data computers installed without Baro Set pots should be configured as Cat 2 ID 1.

** EGPWS installations with the B&D 2600 ADC should be configured for Cat 2 ID 6 because the B&D 2600 Altitude Rate ARINC 429 label 212 has a poor response to altitude changes and causes nuisance alerts.

3.4.3 Digital –ARINC 575 (Cat. 2 ID 2)

Air Data Type 2 (ADC-80 or equivalent) is a low speed, digital ARINC 575 signal having the air data labels 203, 206, 212, and 213.

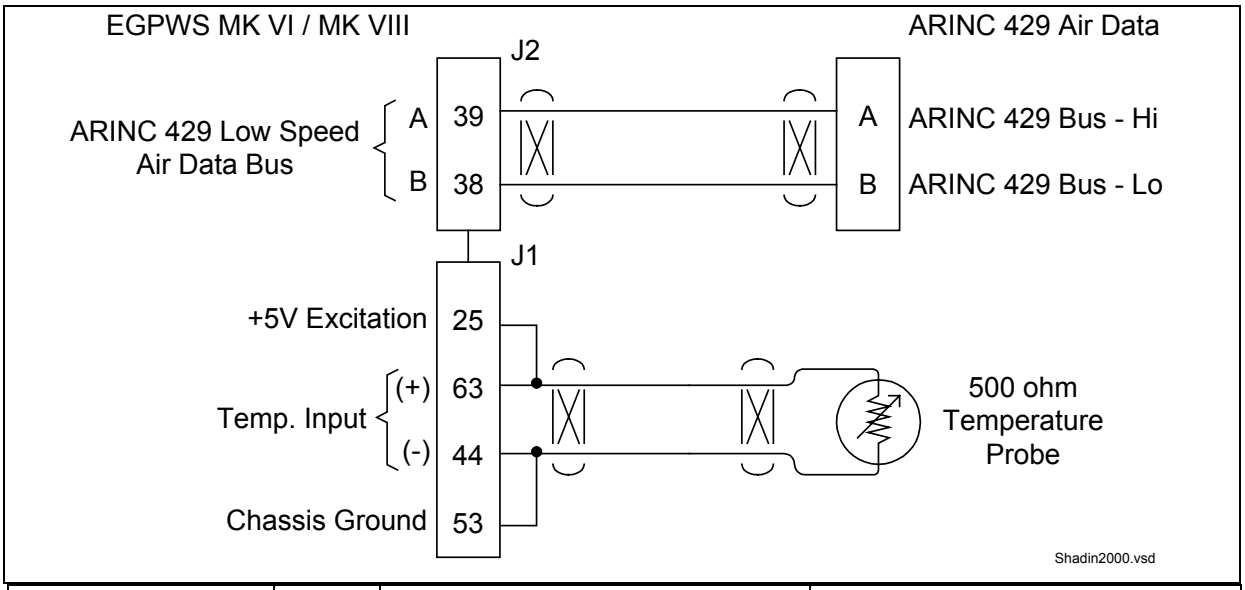


Vendor Model	Cat 2 ID	Bus 1 A	Bus 1 B	Bus 2 A	Bus 2 B
Collins ADC-80( ) Collins ADC-82A	2	P3-35	P3-36		
B&D 90004	2	J1-27	J1-9		

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

3.4.4 Shadin 200 0 (Cat. 2 ID 10)

Air Data Type 10 (Shadin 2000 or equivalent) is a low speed, digital ARINC 429 signal having the air data labels 203, 204, 206, and 212. Total Air Temperature is from a dedicated (EGPWS) 500-ohm probe using +5 volt excitation from the MK VI/MK VIII EGPWC.

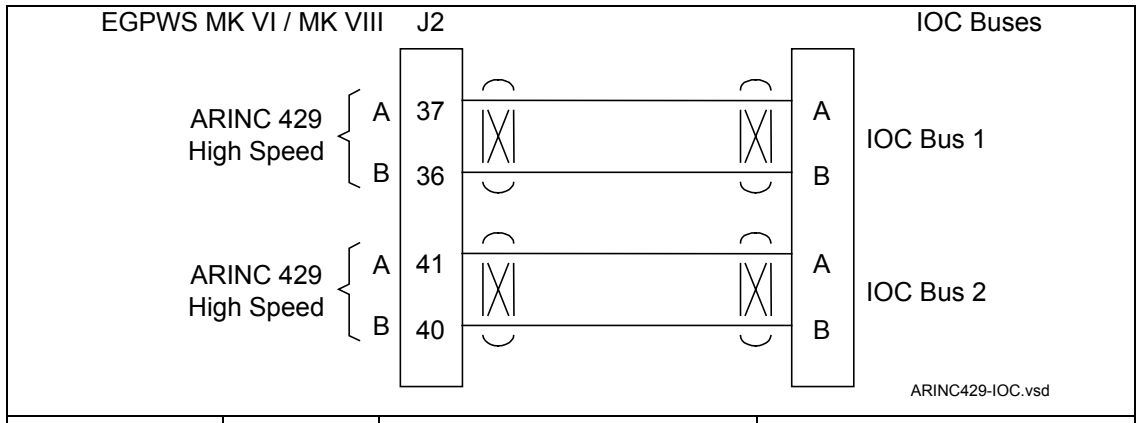


Vendor PN	Cat 2 ID	Bus 1 A	Bus 1 B	Bus 2 A	Bus 2 B
962830-1,2,3	10	J2-7	J2-8		
962830A-1,2,3 962830A-X-S-4 962830A-X-S-5	10	J1-40	J1-22		

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

3.4.5 Digital – ARINC 429 Dual IOC Buses (Cat. 2. ID 255)

Air Data Type 255 (IOC bus or equivalent) is a dual, high speed, digital ARINC 429 signal having the air data labels 203, 204, 206, 210, 212, and 213. ID 255 may only be used in conjunction with other IOC bus selections for categories 6, 8, 9, 10, 11 and 12.



	Cat 2	IOC Bus 1		IOC Bus 2	
Vendor Model	ID	A	B	A	B
BD-100	255	A4P1-1	A4P1-2	A4P101-1	A4P101-2
CJ-1/CJ-2	255	P1-1	P1-2	P101-1	P101-2

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

3.4.6 Instructions

Using Appendix E *Tables 5.2, 5.3.2 and 5.3.2-x* as described above, select the Air Data Type that matches the aircraft air data configuration, feature preferences and version (part number) being installed.
Record the ID number for the Air Data Type from Appendix E *Table 5.3.2* under the Ident No. heading for Step (Category) 2 in Appendix E *Table 5.2.*
Using the Air Data Type number from Appendix E *Table 5.3.2* as "x", go the *Air Data Input Select x Table.*
The electrical interfaces (pin-outs) for the Air Data Input Select are shown in Appendix E *Table 5.3.2-x* and are used to generate the installation wiring diagrams.

3.5 Category 3 – Position Input Select

Category 3 defines the Global Position System bus type and interface. The EGPWS requires a GPS with 8 channels minimum and RAIM capability.

Appendix E *Table 5.3.*3 defines the Position Input Select options and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E Tables 5.3.3-x, where x is the Position Input Type number, define the label set and electrical interface required to support each Position Input Type.

GPS Input selection is available in the following formats: ARINC 429 low speed, ARINC 429 high speed, RS-232, and Internal.

The Internal GPS uses ID 2. A unit equipped with an internal GPS (965-1190-XXX and 965-1220-XXX) may use an external GPS source.

See Category 7 to select GPS Altitude Reference (mean sea level or WGS-84) for ARINC 429 label 076.

3.5.1 ARINC 743 Format

This option provides the ability to specify the GPS input data format as ARINC 743 instead of the ARINC 743A data format. For ARINC 743A the VFOM is in feet and the HFOM is in nautical miles (nm). For ARINC 743 both VFOM and HFOM are in meters.

Note: Universal UNS-1 C/D/K/M GPS only, output is in ARINC 743 format.

3.5.2 GPS Altitude (Label 076) Reference

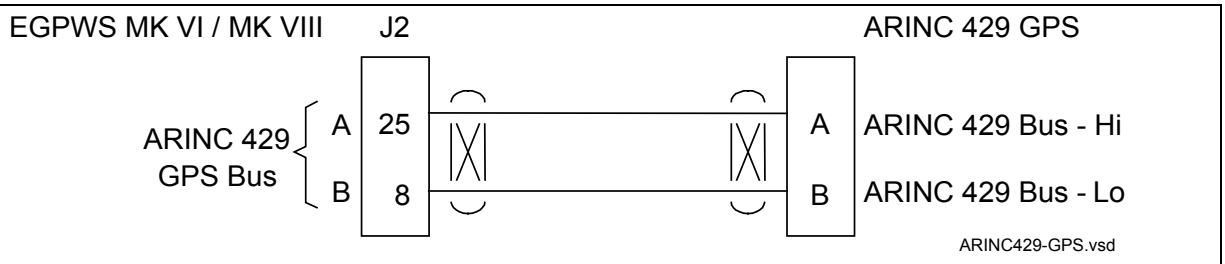
The GPS Altitude (label 076) may be referenced to mean sea level or WGS-84. Determine which reference your GPS position uses and program the GPS Altitude Reference accordingly in Category 7.

Note: Universal UNS-1 C/D/K/M GPS only, output the Altitude Label 076 referenced to WGS-84.

3.5.3 North-South East-West Velocity labels

ID's 10-13 and 253 are provided to support GPS interfaces that do not provide North-South East-West Velocity labels 166 & 174. ID's 0,1,4,5, and 255 are preferred.

3.5.4 ARINC 429 BUS (Cat. 3 ID 0,1,4,5,10-13)

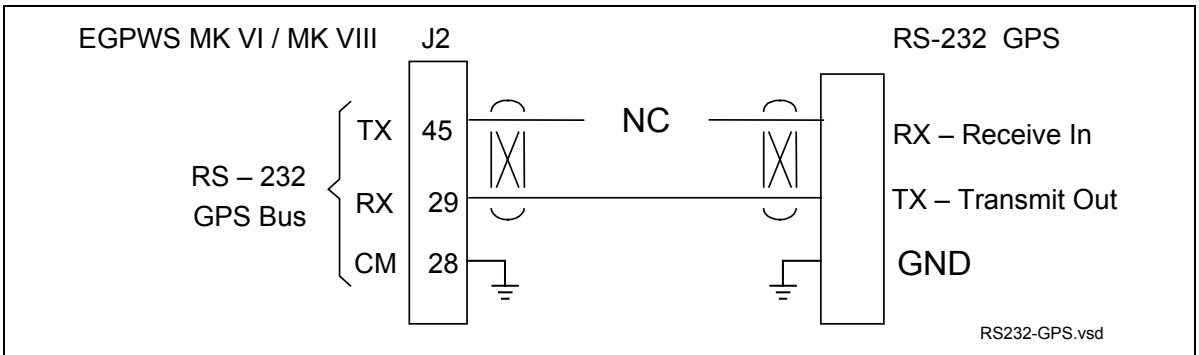


Vendor Model	Cat 3 ID	429 Speed	GPS Alt Ref.	ARINC 743/743A	Bus 1 A	Bus 1 B	Bus 2 A	Bus 2 B
Collins GNLU-910A	Note 5	High	MSL	743A	LMP-2J	LMP-2K		
Collins GPS-4000	0/4[2]	H/L[2]	MSL	743A	MP-11A	MP-11B		
UNS GPS-1000	1	Low	WGS-84	743	TP-12A	TP-12B	TP-11A	TP-11B
UNS GPS-1200	0	Low	MSL	743A	TP-12A	TP-12B	TP-11A	TP-11B
UNS-1C (1017-3X-XXX) or (1017-4X-XXX)	1	Low	WGS-84	743	P1-a	P1-b		
UNS-1D (1192-00-1111XX) or (1192-30-1111XX)	1	Low	WGS-84	743	MP-10J	MP-10K		
UNS-1F, -1E, -1L (2192-00-11110X)	0	Low	MSL	743A	MP-10J	MP-10K	MP-4J	MP-4K
UNS-1K (1116-3X-111X) or (1116-4X-111X)	1	Low	WGS-84	743	MP-4C	MP-4D		
UNS-1M (1013-4X-XXX)	1	Low	WGS-84	743	P2-K	P2-L		
GNS-XLS (17960-0203-) SM04 (17960-0102-) SM07	0	Low	MSL	743A	J101-N5 [1]	J101-N6 [1]		
GNS-XL (18355-) SM06	0	Low	MSL	743A	J101-N5 [1]	J101-N6 [1]		
GNS-X / CDU-XLS (14141-0624-) SM04	0	Low	MSL	743A	JA-A01	JA-A02		
HG2021GBXX	1/5 [2]	H/L[2]	MSL	743	J1-38	J1-39	J1-24	J1-25
HG2021GC/GDXX	0/4 [2]	H/L[2]	MSL	743A	J1-38	J1-39	J1-24	J1-25
HT1000/HT9100	10/12	H/L	WGS-84	743A	MP-C02	MP-C01		
FreeFlight (Trimble) 2101 I/O Approach Plus (81440-XX software ver. 241F)	0	Low	MSL	743A	J1-16	J1-23	J1-58	J1-57

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

1 The Enhanced GNS-XLS ARINC 429 bus also contains Range label
2 HG2021G: Pin 21 open = high speed; Pin 21 GND = Low speed; GPS-4000:
3 North/South Velocity (label 166) and East/West Velocity (label 174) are required in MK VI / MK VIII -008 software and on.
4 NOT COMPATIBLE with MK VI / MK VIII EGPWS
Honeywell HT-9000 / KLN-89 / KLN-90 / HG2021AB / GNS-XES
IIMorrow Apollo 2101
Trimble 2100 / 2101 / TNL8100
Universal GPS-950, UNS-1B
5 Check manufacturer for compatibility with North-South, East-West Velocities.

3.5.5 RS-232 Transmit-Receive, 9600 baud (Cat. 3 ID 3)



Vendor Model	GPS Alt Ref.	ARINC 743/743A	NS[3] EW	RS-232 RX	RS-232 TX	RS-232 GND
GARMIN GNS430/530[2] Software Version 2.21	MSL	N/A	Note 3		P4001-56	Chassis
KLN 900 066-04034-0104 or 066-04034-0204	MSL	N/A	OK		P9002-13	Chassis
KLN 94	MSL	N/A	OK		P941-6	Chassis

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

1 The KLN 89/89B/90/90A/90B are not compatible.

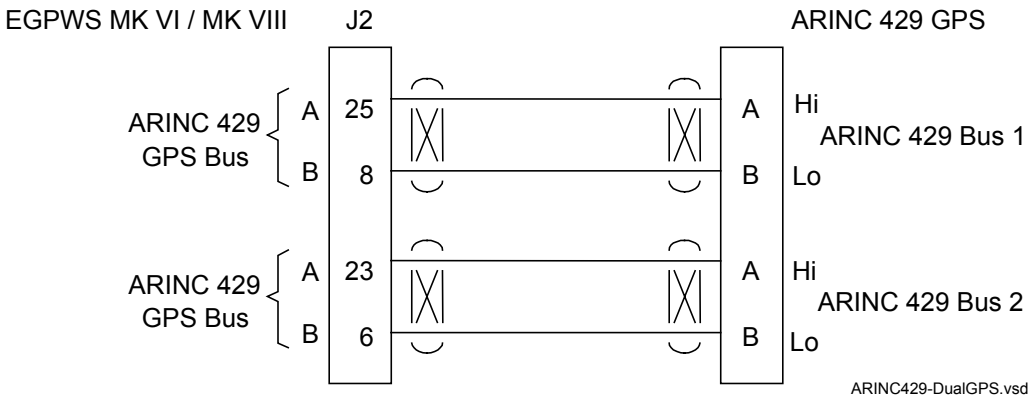
2 The GNS 430 software mod is also applicable to the GPS 400 and GNC 420 units.

3 Check manufacturer for compatibility with North-South, East-West Velocities.

3.5.6 Dual ARINC 429 BUS (Cat. 3 ID 253 & 255)

NOTE: If GPS #2 is not installed in the aircraft, then use ID 4 or GPS bus #1 must be connected in parallel to both EGPWS GPS input ports.

NOTE: Non-IOC aircraft can use ID 253 or 255 to activate dual GPS inputs for redundancy and improved system availability, but the interface must have dual High Speed 743A GPS, and this cannot be used if using Category 10 ID 5 or Category 11 ID 2.



Aircraft Model	Cat 3 ID	429 Speed	GPS Alt Ref.	ARINC 743/743A	Bus 1 A	Bus 1 B	Bus 2 A	Bus 2 B
	253 [1]							
BD 100	255	High	MSL	743A	A25BP1-6A	A25BP1-6B	A24BP1-6A	A24BP1-6B
CJ1/CJ2	255	High	MSL	743A	TBD	TBD	TBD	TBD

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

1 ID 253 is a optional configuration for compatibility with IOC that are missing North-South, East-West Velocities labels.

3.5.7 Instructions

Using Appendix E *Tables 5.2, 5.3.3 and 5.3.3-x* as described above, select the Position Input Type that matches the aircraft Position Input configuration, feature preferences and version (part number) being installed.
Record the ID number for the Position Input Type from Appendix E *Table 5.3.3* under the Ident No. heading for Step (Category) 3 in Appendix E *Table 5.2.*
Using the Position Input Type number from Appendix E *Table 5.3.3* as "x", go the *Position Input Select x Table.*
The electrical interfaces (pin-outs) for the Position Input Select are shown in Appendix E *Table 5.3.3-x* and are used to generate the installation wiring diagrams.

3.6 Category 4 – Altitude Callouts

Category 4 defines the Altitude Callout menu choices and Smart '500' Callout selection.

Appendix E Table 5.3.4 defines the Altitude Callout Menu options and identifies the first MK VI/MK VIII EGPWS version in which the option was available (see the Effectivity entry).

The Altitude callout menus have selected combinations of "Minimums-Minimums", "Minimums", "1000", Smart "500", "500", "500 Above" Field, "400", "300", "200", "100", "50", "40", "30", "20", and "10". No altitude callouts may also be selected.

The Altitude Callout menu provides altitude annunciation for descent below predefined altitudes (example: "One Hundred" is annunciated when descending through 100 feet radio altitude).

A "500" foot callout is available that will issue a "500" callout once during each approach when the aircraft is 500' AGL.

A "Smart 500" foot callout is available that will issue a "500" callout when the aircraft is 500' AGL. This callout is active only during non-precision approaches or when the Glideslope or Localizer deviation is greater than 2 dots.

The "500 Above" Field callout will be annunciated once during each approach when the aircraft is within 5 nm of a runway in the database and descends through 500 ft above that runway. It compares the GPS-based geometric altitude with the closest runway field elevation. The callout may be optionally chosen to annunciate "Five Hundred" or "Five Hundred Above". This requires Category 6 ID other than 2 (TAD/TCF must be active).

"Minimums-Minimums" callout can be selected or deselected from these combinations by connecting or not connecting the Decision Height (DH) discrete (J1-33) of Category 8.

Recommendation: Honeywell recommends at least a Smart '500' callout and a "Minimums-Minimums" callout. FAA and JAA approved installations require a 500 foot callout.

Using Appendix E *Table 5.2 and 5.3.4* as described above, select the preferred Altitude Callout Menu Type (ID) that matches the feature preferences and version (part number) being installed.
Record the ID number for the Altitude Callout Menu Type from Appendix E *Table 5.3.4* under the Ident No. heading for Step (Category) 4 in Appendix E *Table 5.2.*
If the "Minimums-Minimums" callout will be used, use the electrical interfaces (pin-outs) for Radio Altitude Input Select Type (Category 8) shown in Appendix E *Table 5.3.8-x* to generate the installation wiring diagrams.

3.7 Category 5 – Audio Menu Select

Category 5 defines four Audio Menu options. Retractable Gear aircraft, Type 0 (basic) and Type 1 (alternate) and Fixed Gear aircraft, Type 2 (basic) and Type 3 (alternate).

Appendix E *Table 5.3.5* defines the Audio Menu select options and identifies the first MK VI/MK VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E *Tables 5.3.5-x*, where X is the Audio Menu Type, defines the voice callouts for each menu. **DGAC-registered aircraft are required to use Alternate Audio Menu.**

Recommendation: Honeywell recommends the Basic Audio Menu (except for DGAC-registered aircraft).

3.7.1 Audio Menu Selection

Audio menu must be selected to provide EGPWS callouts. The differences in the Audio Menu Types are shown in the following comparison tables.

ALERT/WARNING CONDITION	Audio Menu	
	Basic (Type 0 and 2)	Alternate (Type 1 and 3)
Terrain Awareness Preface	Terrain Terrain	Terrain Ahead
Obstacle Awareness Preface	Obstacle Obstacle	Obstacle Ahead
Terrain Awareness Caution	Caution Terrain	Terrain Ahead
Obstacle Awareness Caution	Caution Obstacle	Obstacle Ahead

ALERT/WARNING CONDITION	Audio Menu	
	Retractable Gear (Type 0 and 1)	Fixed Gear (Type 2 and 3)
Mode 4 Too Low Gear	Too Low Gear	Too Low Flaps

3.7.2 Instructions

Using Appendix E *Tables 5.2, 5.3.5 and 5.3.5-x* as described above, select the Audio Menu Type that matches the feature preferences and version (part number) being installed.

- Basic or Alternate menu
- Retractable Gear or Fixed Gear

Record the ID number for the Audio Menu Type from Appendix E *Table 5.3.5* under the Ident No. heading for Step (Category) 5 in Appendix E *Table 5.2.*

3.8 Category 6 – Terrain Display Select

Category 6 defines the Terrain Display options available.

TA&D and TCF mode *enabling/disabling* is controlled by Category 6.

Peaks mode *availability* is controlled by Category 6 since its availability is determined by the display configuration. Peaks mode *enabling/disabling* is controlled by Category 7. Each of the options controlled by Category 6 is described below.

Appendix E *Table 5.3.6* defines the Terrain Display Select options (*Display Configuration Group Tables, Display Input Control Group Tables* and *Output 429 Bus Group Tables)* and identifies the first MK VI/MK VIII EGPWS version in which the option was available (see the Effectivity entry). Appendix E *Table 5.3.6* also defines the EGPWS version (MK VI or MK VIII) in which the option is available (see the EGPWS entry).

Appendix E *Tables 5.3.6.1-x*, where x is the Display Configuration group number, define the display options and the electrical interface required to support each Display Configuration.

Appendix E Tables 5.3.6.2-x, where x is the Display Input Control group number, define the label set and the electrical interface required to support each Display Configuration.

Appendix E Tables 5.3.6.3-x, where x is the Output 429 Bus group number, define the label set and the electrical interface supporting each Display Configuration output requirements.

Figure 3.8-1 is an example of single tube Wx/Terrain display wiring connections.

3.8.1 TAD & TCF Selection

The Terrain Clearance Floor (TCF) algorithm identifies premature descent for approaches regardless of aircraft configuration. It creates a terrain clearance envelope around the airport to provide protection against controlled flight into terrain situations beyond that of the basic GPWS.

The Terrain Awareness & Display feature consists of a Terrain Awareness Alerting feature and a Terrain Awareness Display feature. The Terrain Awareness Alerting feature continuously computes terrain clearance envelopes ahead of the aircraft and issues alerts if the boundaries of these envelopes conflict with terrain elevation data in the terrain database. The Terrain Awareness Display feature displays the data terrain relative to aircraft altitude.

Both TA&D and TCF are Enabled for all ID's in Appendix E *Table 5.3.6 except* for "TA&D and TCF Disable" (ID 2).

3.8.2 Terrain Display Configuration Group

This option provides the ability to specify the type of Terrain Display compatible with the aircraft configuration. A definition of each of the entries in the Display Configuration Group tables is provided in the table below.

Function	Value		Reference section
Display Type	*Display manufacturer, model, etc.*		
Sweep Type	*The type of sweep used for terrain data (fan, standard, etc.)*		
Auto Pop Up	Category 7, Options Select Group #1		
	TA&D Alternate Pop Up: False	TA&D Alternate Pop Up: True	
	The TA&D Alternate Pop Up is set to False or True in Category 7. If False, Pop Up behavior for the terrain display is described here.	*The TA&D Alternate Pop Up is set to False or True in Category 7. If True, Pop Up behavior for the terrain display is described here.*	
Peaks Mode See Note 1	Category 7, Options Select Group #1		
	Peaks Enable: False	Peaks Enable: True	
	Peaks Enable is set to False or True in Category 7. The effect of setting it to False is described here.	*Peaks Enable is set to False or True in Category 7. The effect of setting it to True is described here.*	
Manual select	*Describes if/when terrain display(s) can be manually selected*		
Manual deselect	*Describes if/when terrain display(s) can be manually deselected*		
Auto Range	*Defines if the display data is automatically scaled and, if so, the scale used (such as 10 nautical miles)*		
Moving Marker	*Indicates whether or not a moving marker is provided*		
Overlay Page	*Describes where "TERR" and Peaks Elevations overlays will be located on the display screen.*		
Display bus type	*Defines the display bus type 'KC Picture Bus' (KCPB was ASPB), 'Honeywell Picture Bus' or 'ARINC 453'.*		
CHANNEL TX453-1	CONNECT TO:		
A = J1-58 B = J1-59	*Indicates the correct connection for these pins*		
CHANNEL TX453-2	CONNECT TO:		
A = J1-56 B = J1-57	*Indicates the correct connection for these pins*		

Notes: 1 Peaks Mode "(Not Available)" or "(Elevations via overlay)" shown here. Peaks mode "Not Available" means that this display type cannot display Peaks Mode.

Table 3.8.2-1 Definition of Display Configuration Group Tables (Appendix E Section 5.3.6)

3.8.3 Display Input Control Group

This input bus is connected to the display (or display controller) and transmits Range settings, Display Mode, and Display status to the MK VI/MK VIII EGPWC. In some installations where the terrain display(s) is controlled from one source (controller) the Range inputs to the EGPWS must be paralleled to satisfy dual input requirements of the EGPWS.

Display Input Control Group

CHANNEL 429_422RX_1	**CONNECT TO: WXR Output 429 bus 1**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range Status	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
CHANNEL 429RX_3	**CONNECT TO: WXR Output 429 bus 1**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range Status	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)

In some installations where the Radar (Terrain) displays are controlled from one source, the Range input buses into the EGPWS must be paralleled to satisfy EGPWS dual input requirements.

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

3.8.4 Output 429 Bus Group

This output bus is commonly connected to EFIS and/or EICAS displays and Flight Recorders. The output transmits MK VI/MK VIII EGPWC alert, fault, and mode status to other systems.

Output 429 Bus Group

Channel	Pins	Comments
429TX_1	A = J2-43 B = J2-42	Transmits Label sets: (Section 7)
429TX_2	A = J2-26 B = J2-9	No Connection (No Data Output)

3.8.5 Instructions

Using Appendix E *Tables 5.2, 5.3.6, and 5.3.6.1-x* as described above, select the Terrain Display Select Type (ID) that matches the aircraft configuration, feature preferences and version (part number) being installed.

Record the ID number for the Terrain Display Select Type from Appendix E *Table 5.3.6* under the Ident No. heading for Step (Category) 6 in Appendix E *Table 5.2.*

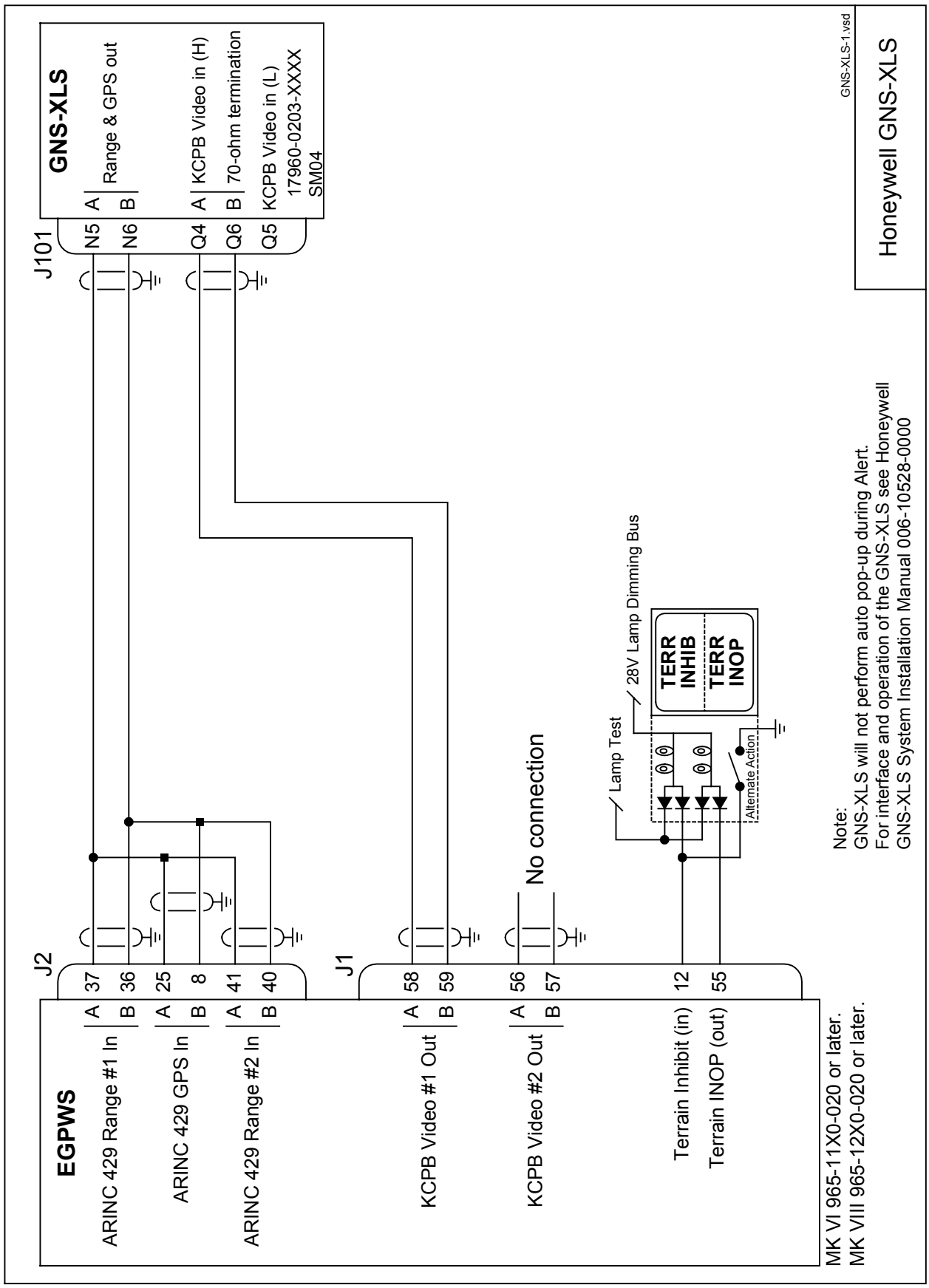
Record the Display Configuration Group number here → _____.

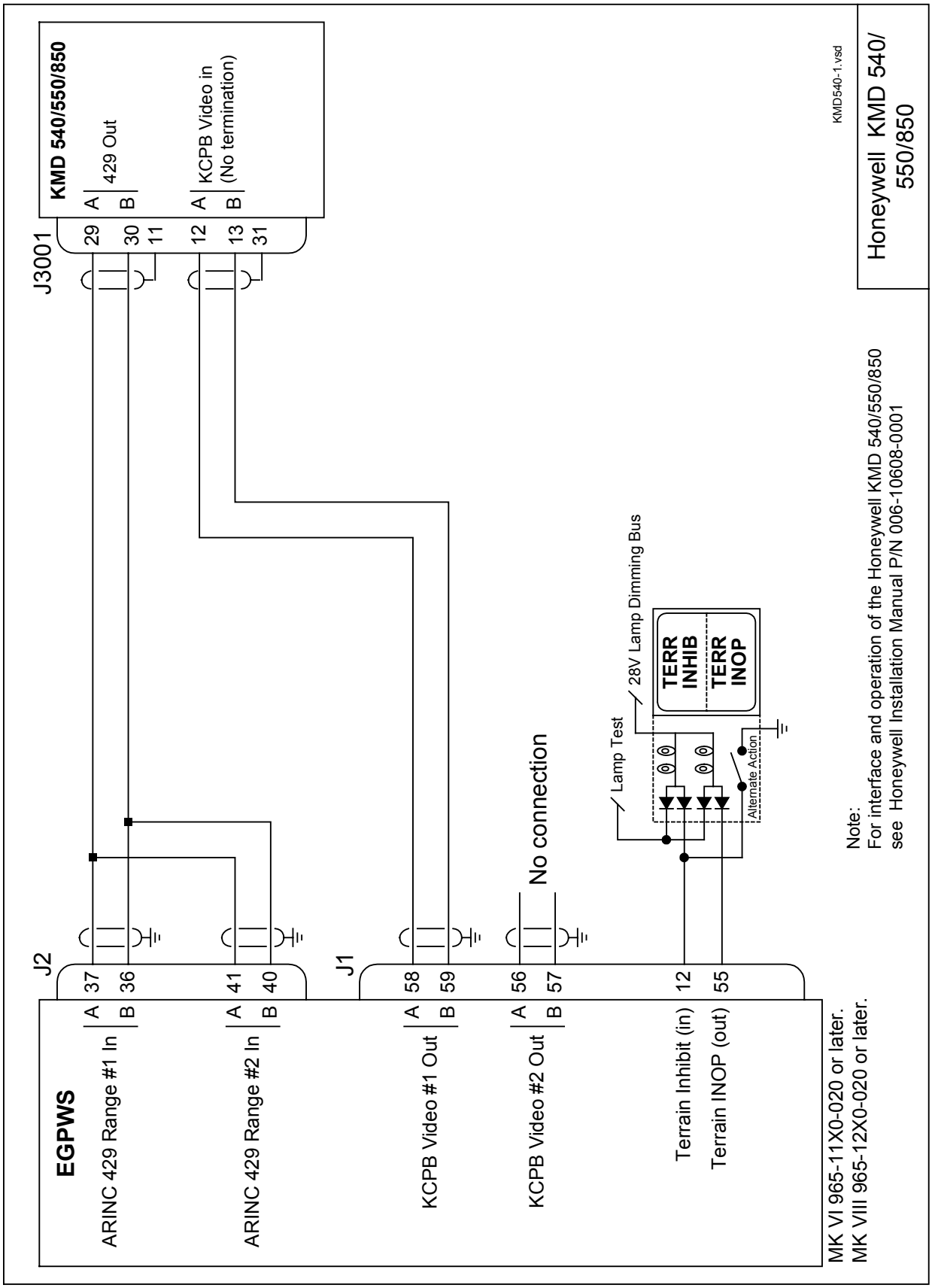
Note: This information is used to determine TA&D Alternate Pop Up and Peaks Mode availability for Category 7.

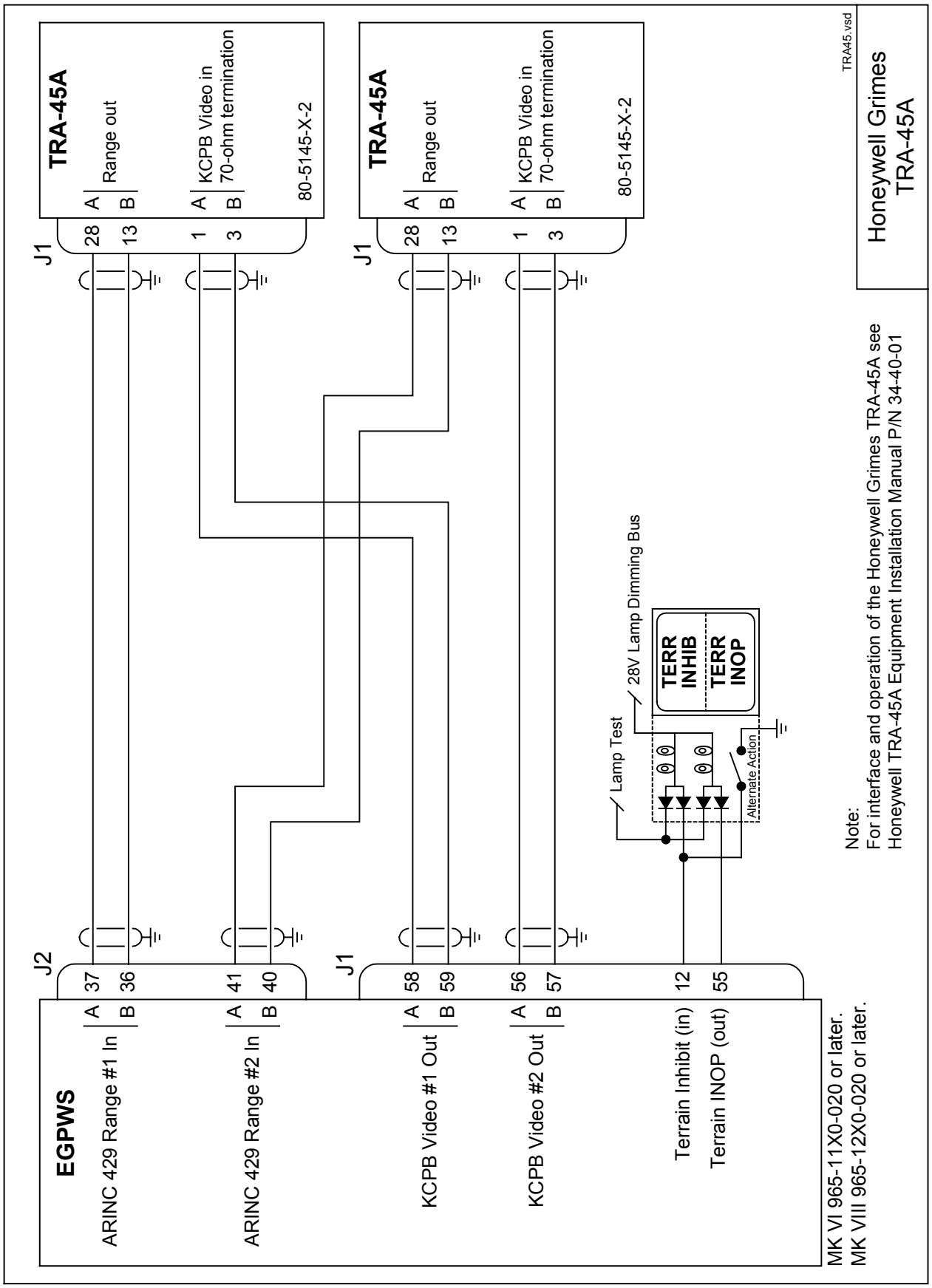
The electrical interfaces (pin-outs) for the Display Configuration Group, Display Input Control Group, and Output 429 Bus Group are shown in the *Appendix E Table 5.3.6.1-x* and are used to generate the installation wiring diagrams.

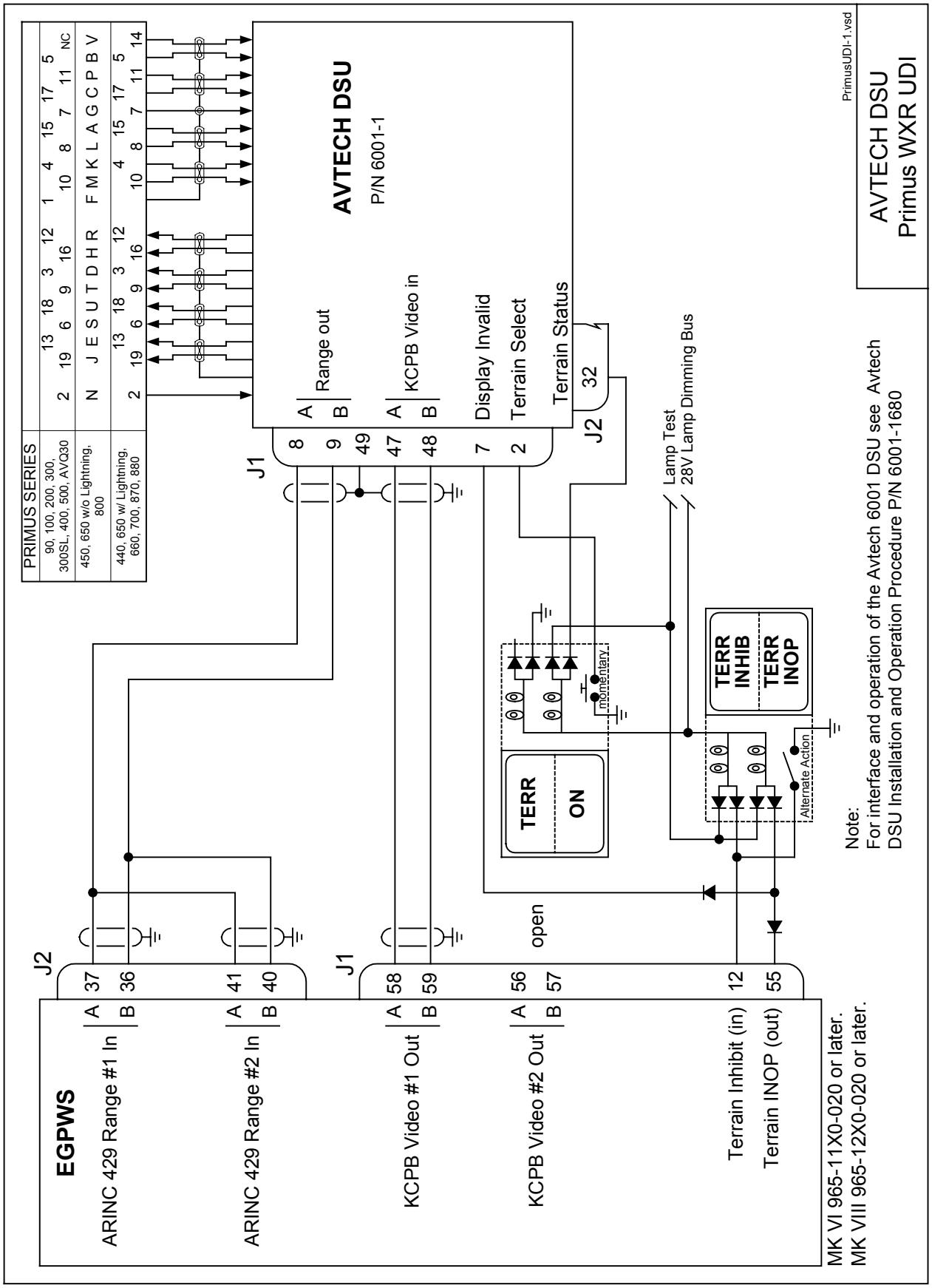
3.8.6 Sample Display Schematics

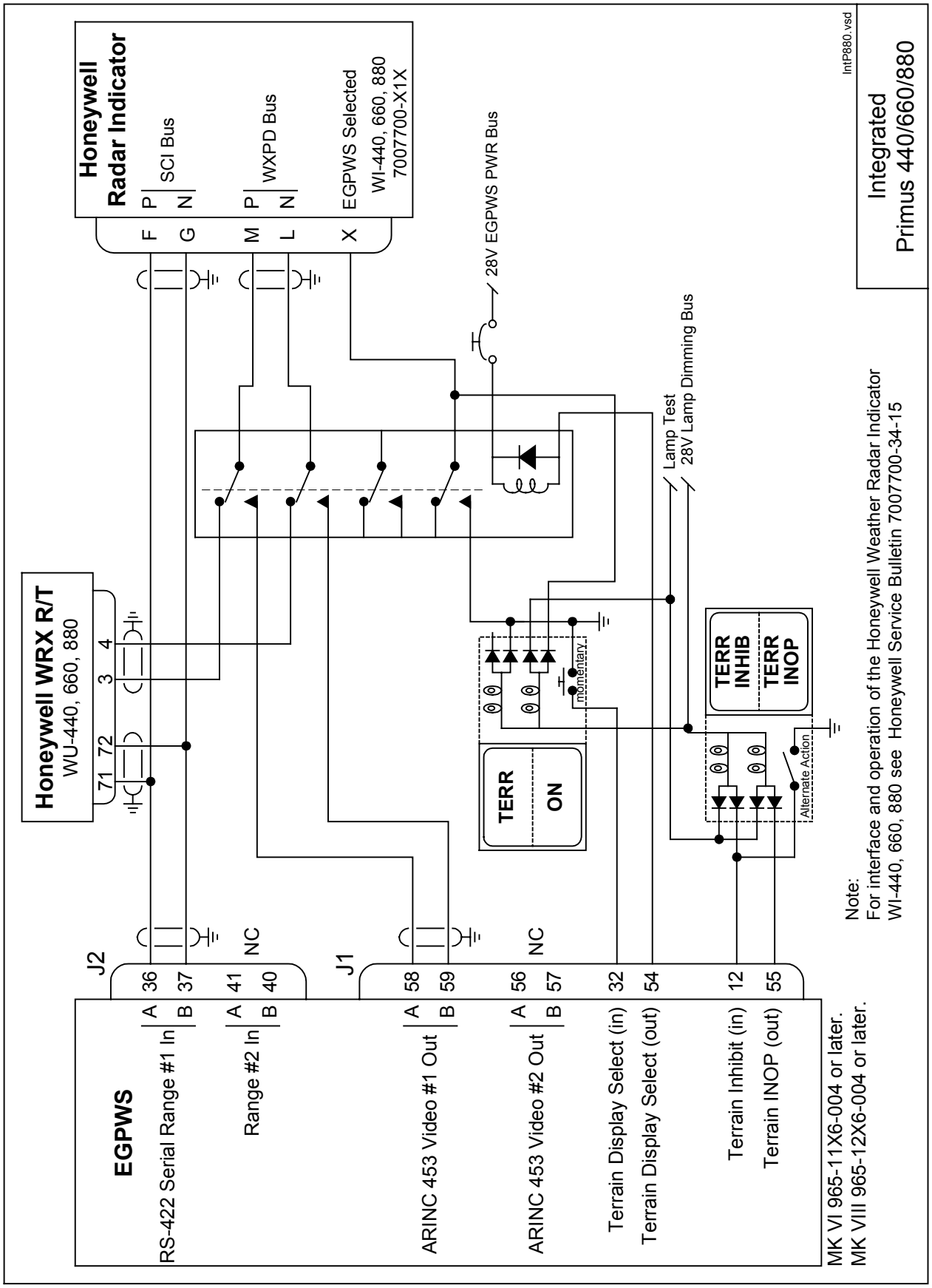
Honeywell GNS-XLS
Honeywell KMD 540 / 550 / 850
Honeywell Grimes TRA-45A
Honeywell Primus UDI with Avtech DSU
Honeywell Primus 440/660/880 Integrated
Honeywell Primus 1000
Honeywell Bendix RDR 2000 / IN182A
Honeywell Bendix PPI-4B
Honeywell Bendix EFS-40/50
Collins WXI-701/711
Collins Pro-Line II / IV
Honeywell SPZ8000 / SG-802/803/806
Universal MFD-640

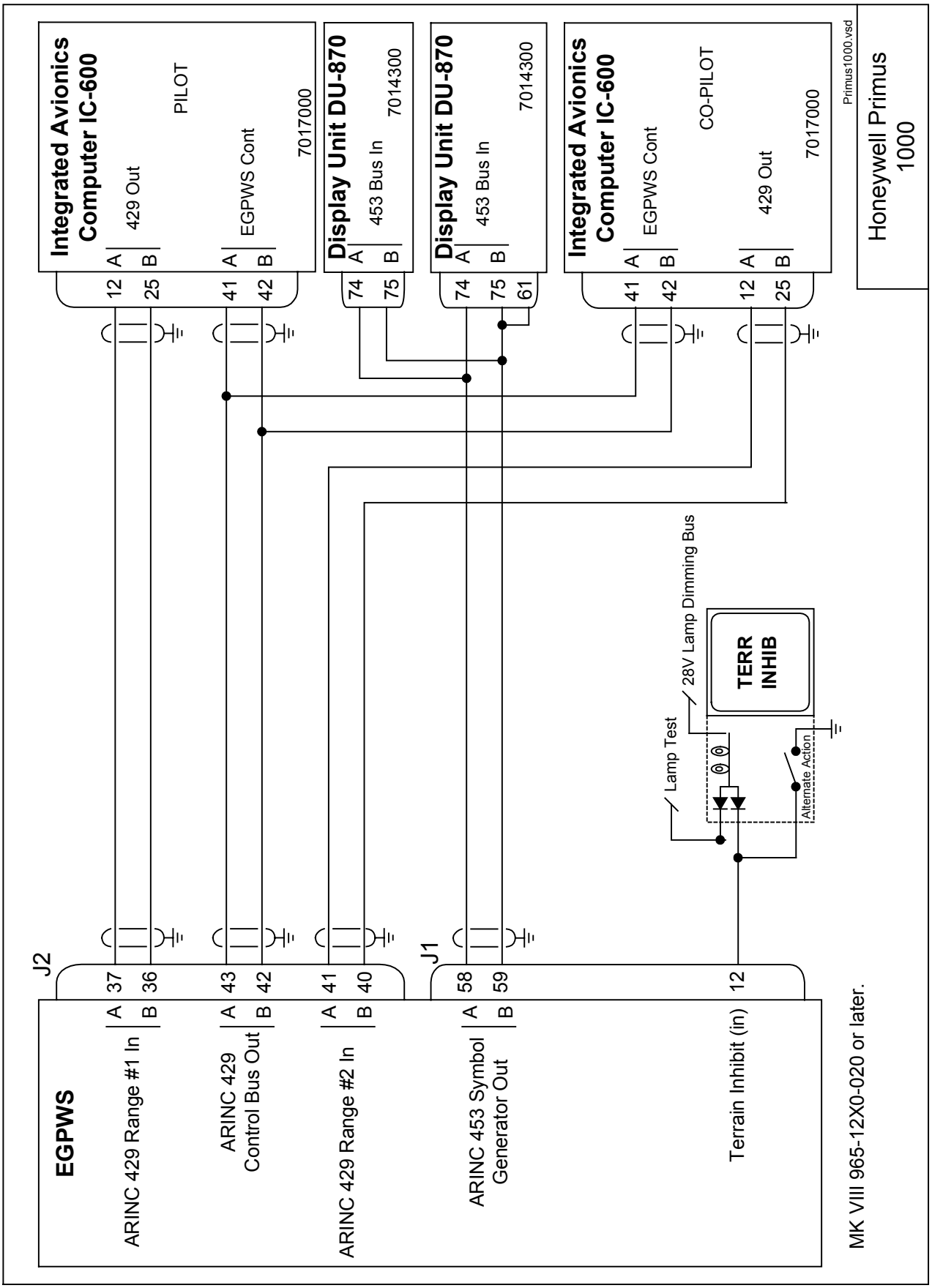

Honeywell GNS-XLS
GNS-XLS-1.vsd
GNS-XLS
J101
N5 A Range & GPS out
N6 B
Q4 A KCPB Video in (H)
Q6 B 70-ohm termination
Q5 KCPB Video in (L)
17960-0203-XXXX
SM04
EGPWS
J2
37 A ARINC 429 Range #1 In
36 B
25 A ARINC 429 GPS In
8 B
41 A ARINC 429 Range #2 In
40 B
J1
58 A KCPB Video #1 Out
59 B
56 A KCPB Video #2 Out
57 B
No connection
12 Terrain Inhibit (in)
55 Terrain INOP (out)
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.
Lamp Test
28V Lamp Dimming Bus
TERR INHIB
TERR INOP
Alternate Action
Note:
GNS-XLS will not perform auto pop-up during Alert.
For interface and operation of the GNS-XLS see Honeywell
GNS-XLS System Installation Manual 006-10528-0000

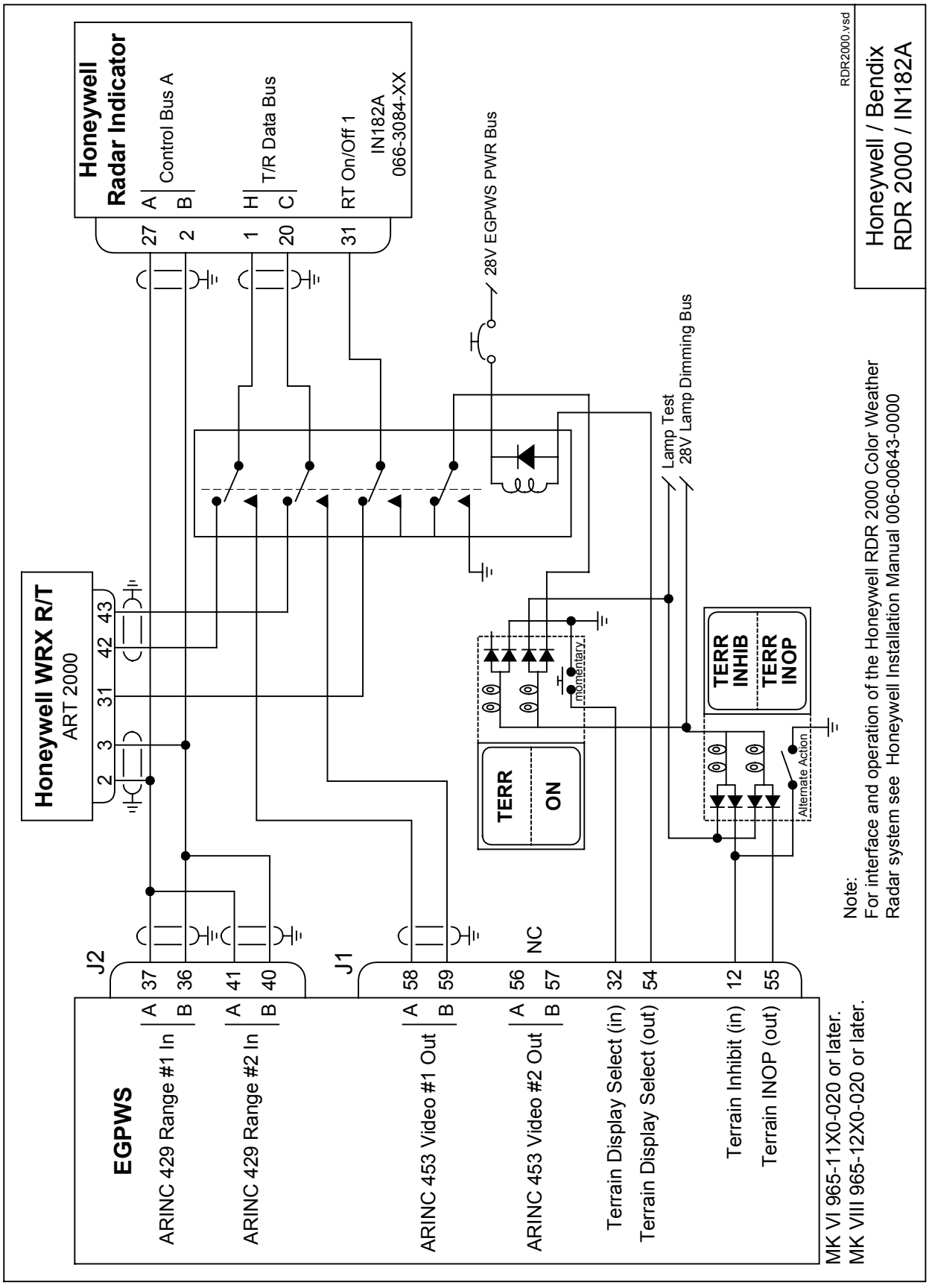

Honeywell KMD 540/ 550/850
KMD540-1.vsd
KMD 540/550/850
A
B
429 Out
KCPB Video in (No termination)
J3001
29
30
11
12
13
31
J2
37
36
41
40
J1
58
59
56
57
12
55
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
KCPB Video #1 Out
KCPB Video #2 Out
No connection
Terrain Inhibit (in)
Terrain INOP (out)
28V Lamp Dimming Bus
Lamp Test
Alternate Action
TERR INHIB
TERR INOP
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.
Note:
For interface and operation of the Honeywell KMD 540/550/850
see Honeywell Installation Manual P/N 006-10608-0001

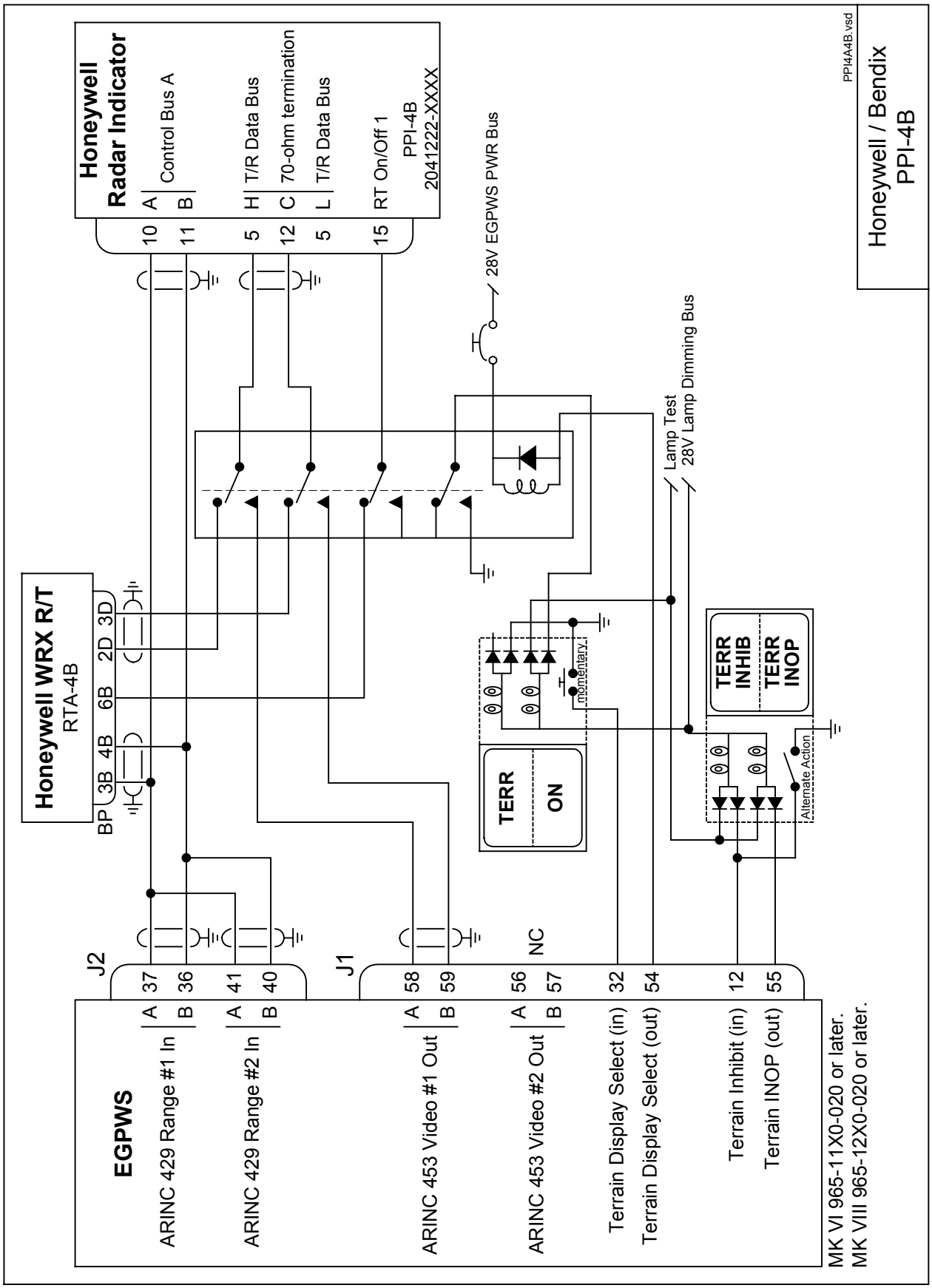

TRA-45A
Range out
KCPB Video in
70-ohm termination
80-5145-X-2
J1
28
13
1
3
A
B
TRA-45A
Range out
KCPB Video in
70-ohm termination
80-5145-X-2
J1
28
13
1
3
A
B
TRA45.vsd
Honeywell Grimes
TRA-45A
Note:
For interface and operation of the Honeywell Grimes TRA-45A see
Honeywell TRA-45A Equipment Installation Manual P/N 34-40-01
28V Lamp Dimming Bus
Lamp Test
TERR
INHIB
TERR
INOP
Alternate Action
J2
J1
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
KCPB Video #1 Out
KCPB Video #2 Out
Terrain Inhibit (in)
Terrain INOP (out)
37
36
41
40
58
59
56
57
12
55
A
B
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.

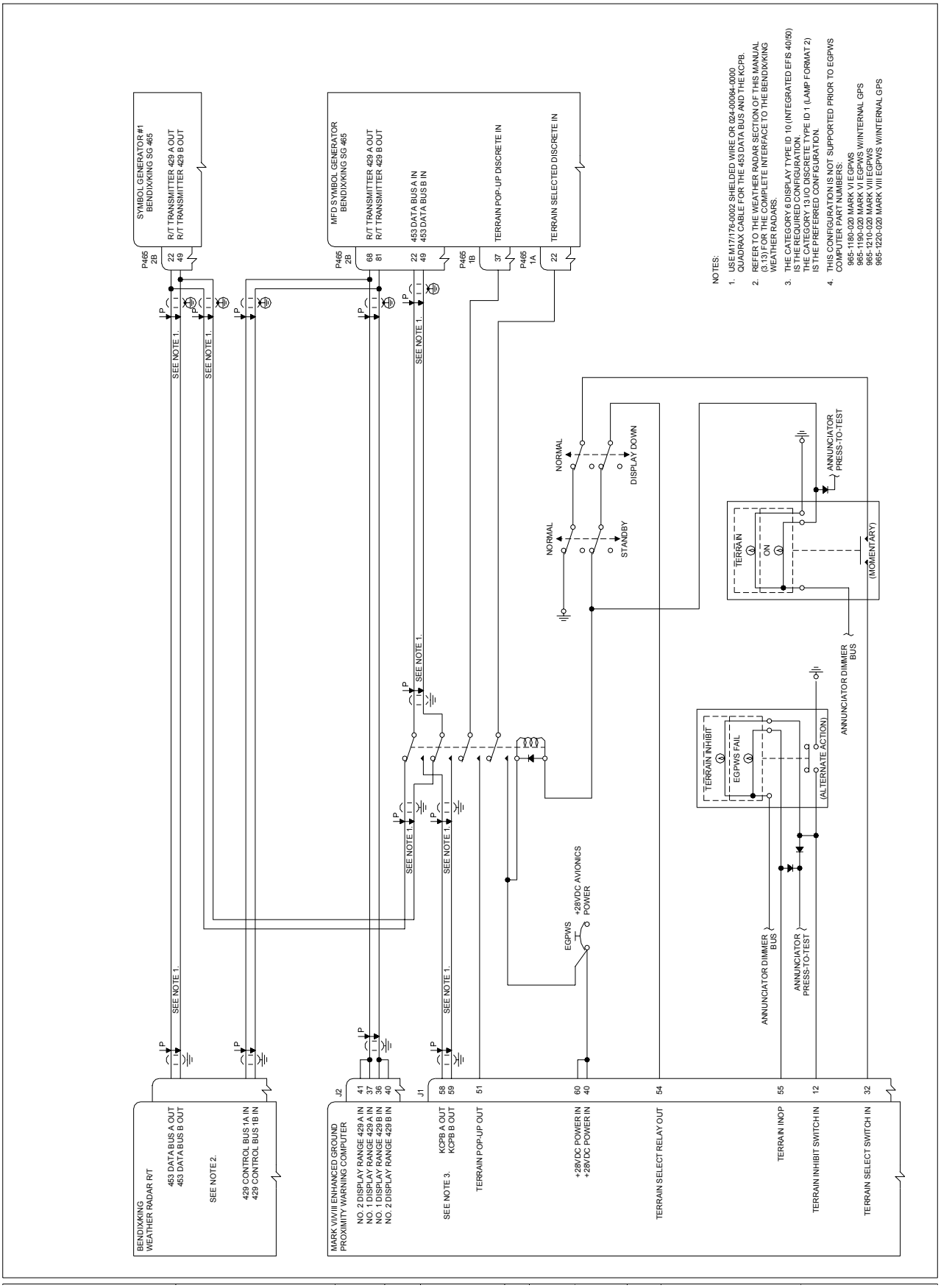

PRIMUS SERIES
90, 100, 200, 300, 300SL, 400, 500, AVQ30
450, 650 w/o Lightning, 800
440, 650 w/ Lightning, 660, 700, 870, 880
AVTECH DSU
P/N 6001-1
Range out
KCPB Video in
Display Invalid
Terrain Select
Terrain Status
Lamp Test
28V Lamp Dimming Bus
momentary
TERR
ON
TERR INHIB
TERR INOP
Alternate Action
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
KCPB Video #1 Out
KCPB Video #2 Out
Terrain Inhibit (in)
Terrain INOP (out)
open
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.
Note:
For interface and operation of the Avtech 6001 DSU see Avtech DSU Installation and Operation Procedure P/N 6001-1680
PrimusUDI-1.vsd
AVTECH DSU
Primus WXR UDI

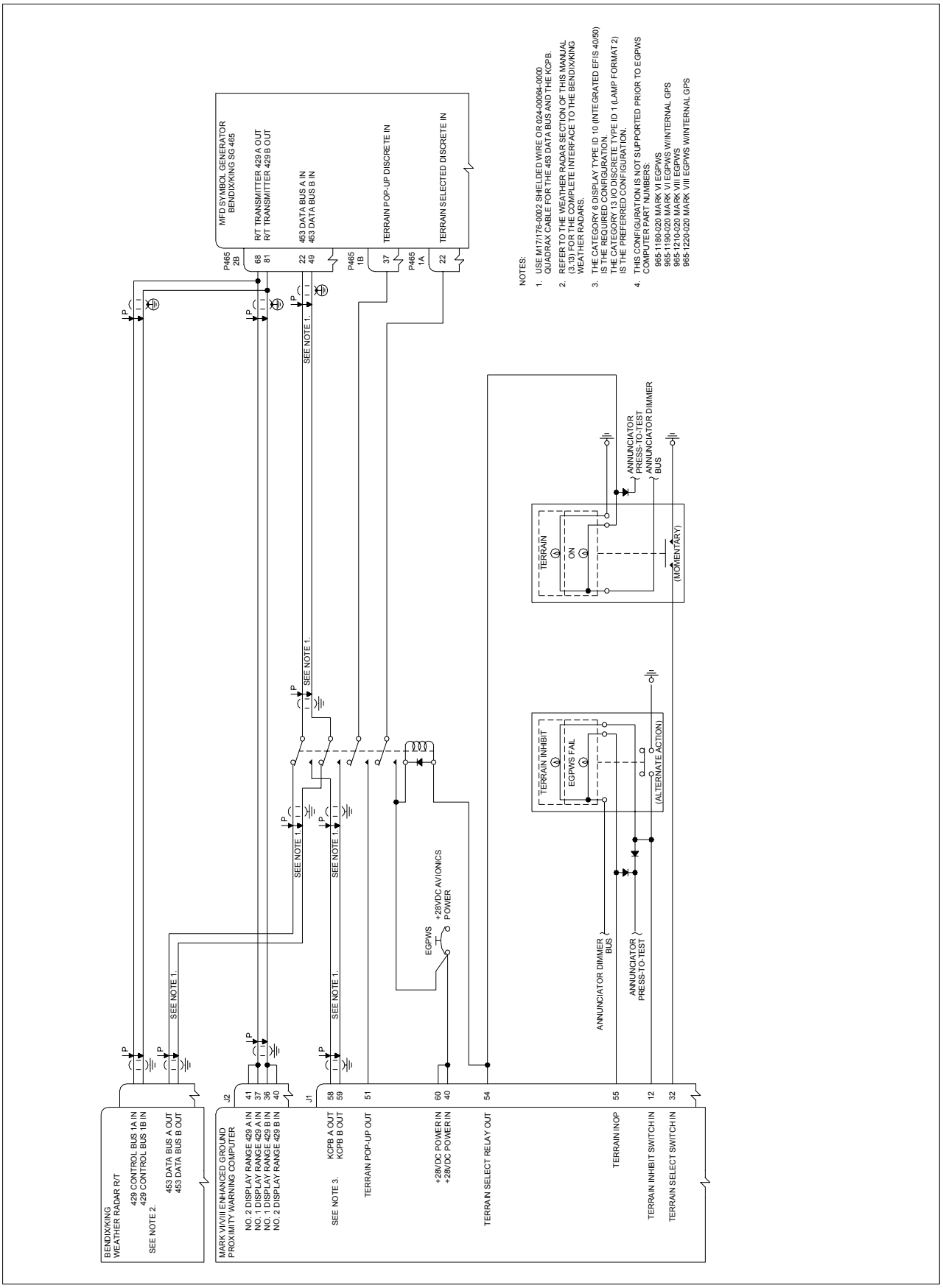

Honeywell
Radar Indicator
P
N
SCI Bus
P
N
WXPD Bus
EGPWS Selected
WI-440, 660, 880
7007700-X1X
F
G
M
L
X
28V EGPWS PWR Bus
Lamp Test
28V Lamp Dimming Bus
Honeywell WRX R/T
WU-440, 660, 880
71
72
3
4
TERR
ON
momentary
TERR
INHIB
TERR
INOP
Alternate Action
J2
J1
36
37
41
40
58
59
56
57
32
54
12
55
A
B
NC
EGPWS
RS-422 Serial Range #1 In
Range #2 In
ARINC 453 Video #1 Out
ARINC 453 Video #2 Out
Terrain Display Select (in)
Terrain Display Select (out)
Terrain Inhibit (in)
Terrain INOP (out)
MK VI 965-11X6-004 or later.
MK VIII 965-12X6-004 or later.
Note:
For interface and operation of the Honeywell Weather Radar Indicator
WI-440, 660, 880 see Honeywell Service Bulletin 7007700-34-15
IntP880.vsd
Integrated
Primus 440/660/880

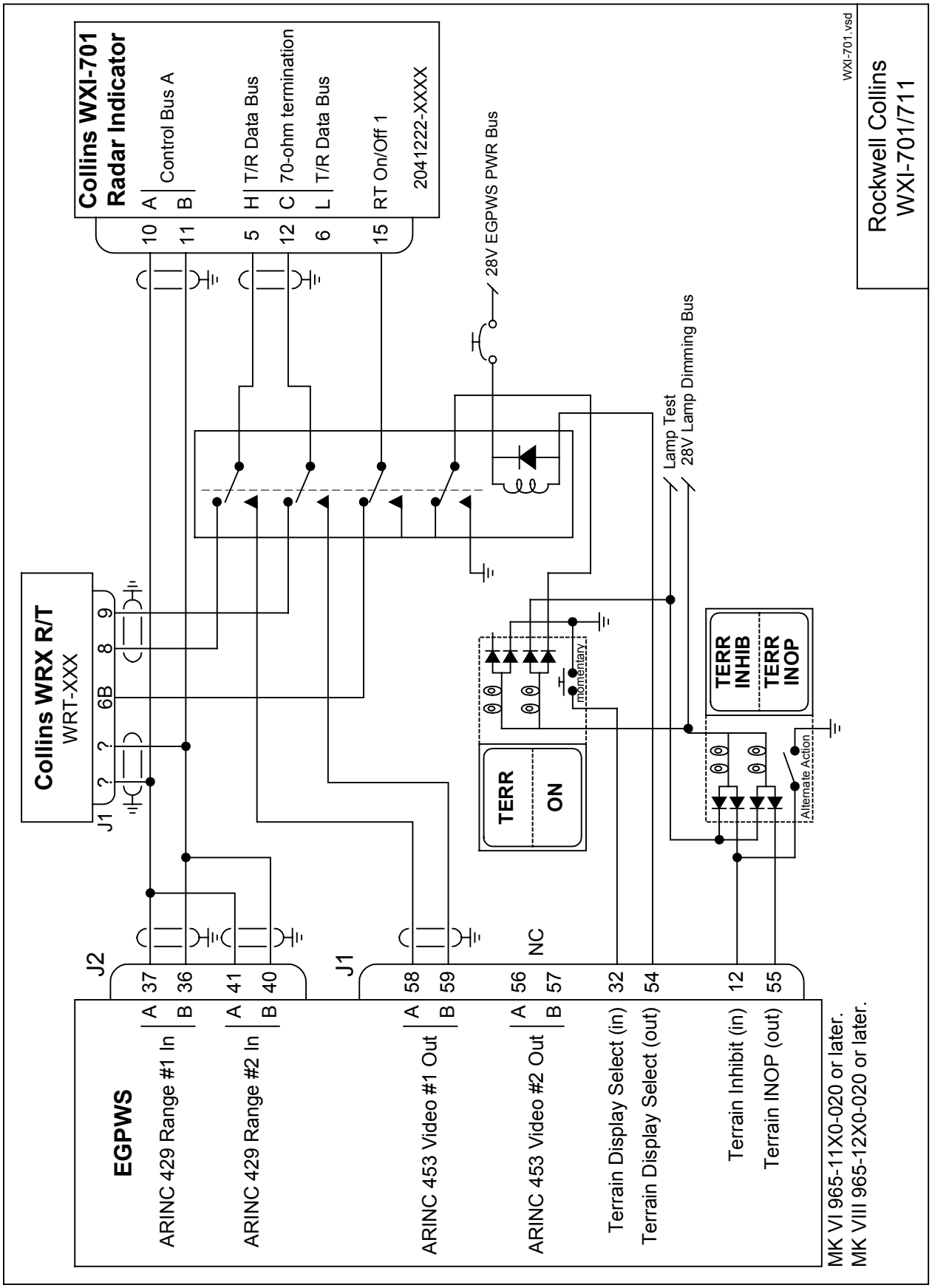

Integrated Avionics Computer IC-600
PILOT
429 Out
EGPWS Cont
7017000
Display Unit DU-870
453 Bus In
7014300
Display Unit DU-870
453 Bus In
7014300
Integrated Avionics Computer IC-600
CO-PILOT
EGPWS Cont
429 Out
7017000
Primus1000.vsd
Honeywell Primus 1000
28V Lamp Dimming Bus
TERR INHIB
Lamp Test
Alternate Action
J2
J1
EGPWS
ARINC 429 Range #1 In
ARINC 429 Control Bus Out
ARINC 429 Range #2 In
ARINC 453 Symbol Generator Out
Terrain Inhibit (in)
MK VIII 965-12X0-020 or later.

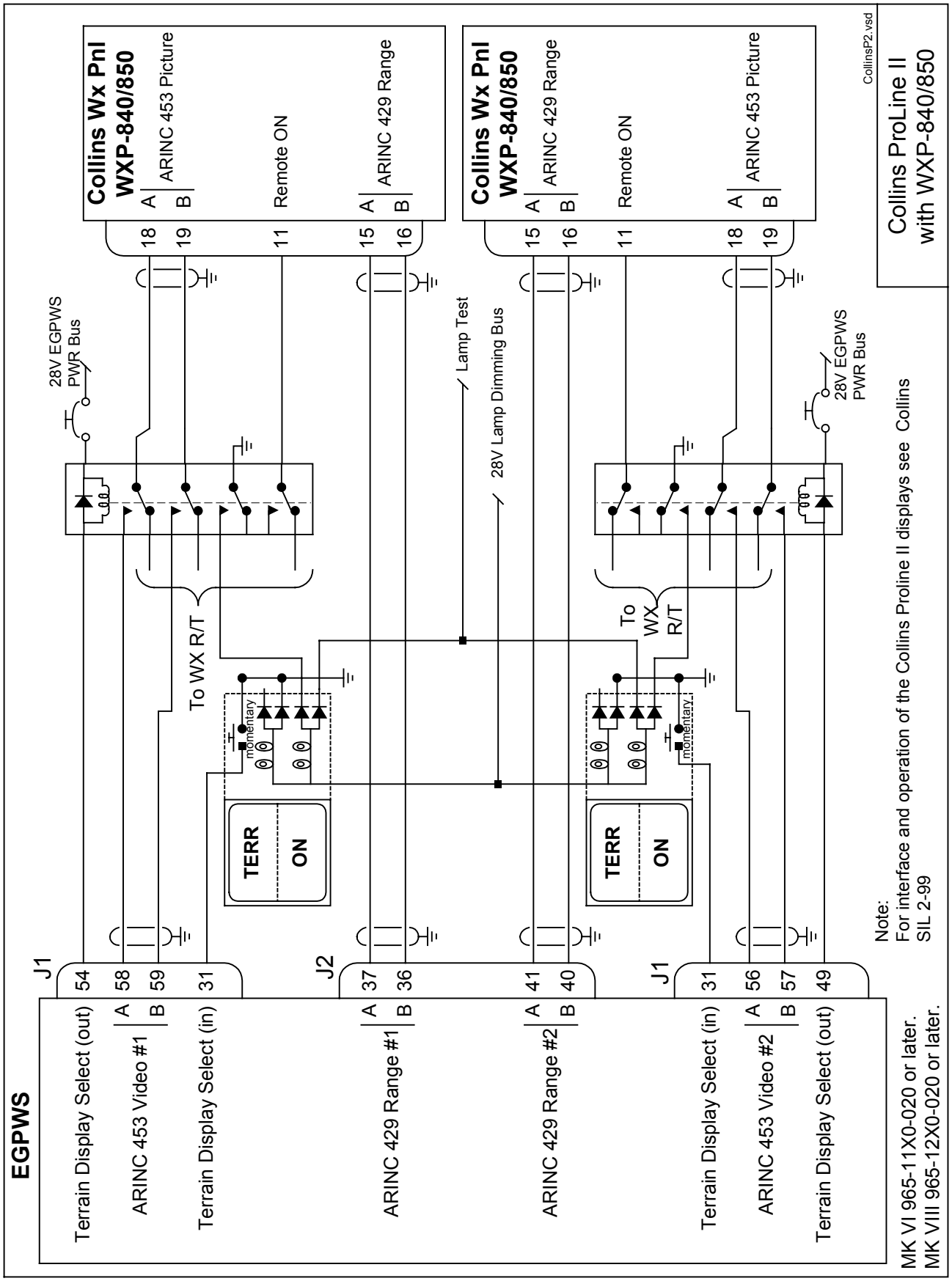

Honeywell / Bendix
RDR 2000 / IN182A
RDR2000.vsd
Honeywell
Radar Indicator
A
B
Control Bus A
H
C
T/R Data Bus
RT On/Off 1
IN182A
066-3084-XX
27
2
1
20
31
28V EGPWS PWR Bus
Lamp Test
28V Lamp Dimming Bus
Honeywell WRX R/T
ART 2000
2
3
31
42
43
momentary
TERR
ON
TERR
INHIB
TERR
INOP
Alternate Action
J2
J1
37
36
41
40
58
59
56
57
32
54
12
55
NC
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
ARINC 453 Video #1 Out
ARINC 453 Video #2 Out
Terrain Display Select (in)
Terrain Display Select (out)
Terrain Inhibit (in)
Terrain INOP (out)
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.
Note:
For interface and operation of the Honeywell RDR 2000 Color Weather
Radar system see Honeywell Installation Manual 006-00643-0000

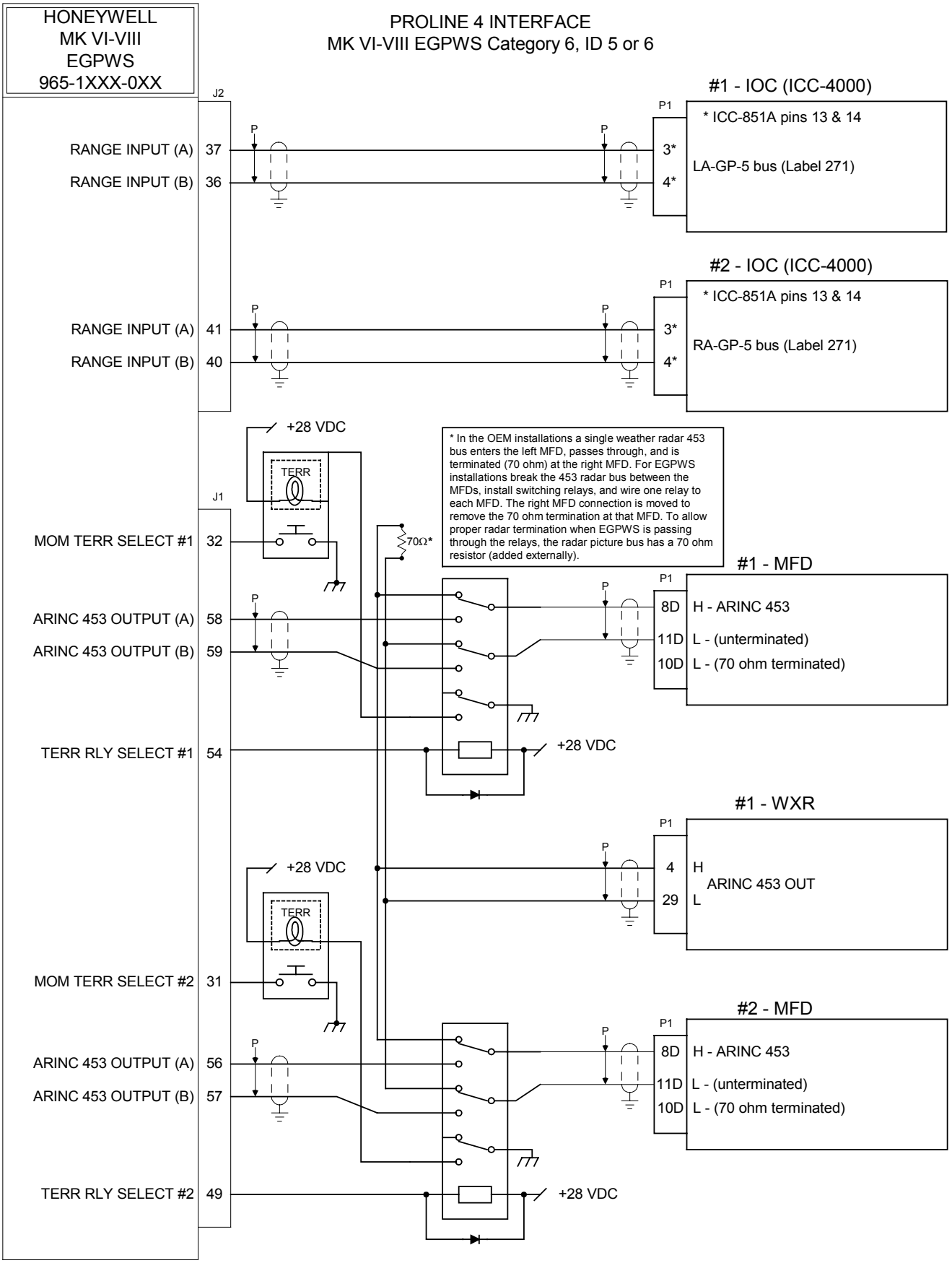

Honeywell / Bendix
PPI-4B
PPI4A4B.vsd
Honeywell
Radar Indicator
A Control Bus A
B
H T/R Data Bus
C 70-ohm termination
L T/R Data Bus
RT On/Off 1
PPI-4B
2041222-XXXX
10
11
5
12
5
15
28V EGPWS PWR Bus
Lamp Test
28V Lamp Dimming Bus
Honeywell WRX R/T
RTA-4B
BP 3B 4B 6B 2D 3D
momentary
TERR
ON
TERR
INHIB
TERR
INOP
Alternate Action
J2
J1
37
36
41
40
58
59
56
NC
57
32
54
12
55
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
ARINC 453 Video #1 Out
ARINC 453 Video #2 Out
Terrain Display Select (in)
Terrain Display Select (out)
Terrain Inhibit (in)
Terrain INOP (out)
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.

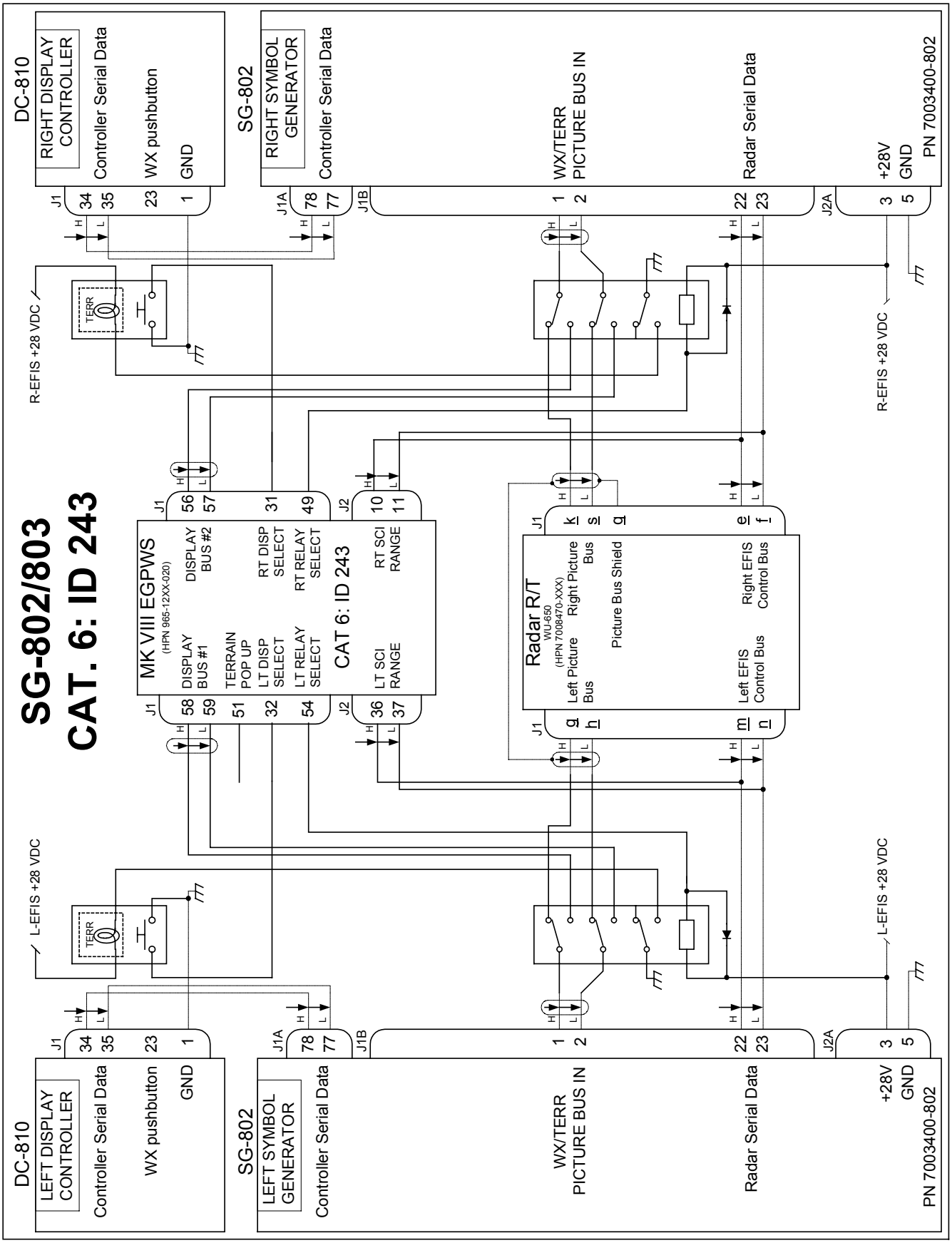

SYMBOL GENERATOR #1
BENDIX/KING SG 465
R/T TRANSMITTER 429 A OUT
R/T TRANSMITTER 429 B OUT
P465
2B
22
49
MFD SYMBOL GENERATOR
BENDIX/KING SG 465
R/T TRANSMITTER 429 A OUT
R/T TRANSMITTER 429 B OUT
453 DATA BUS A IN
453 DATA BUS B IN
TERRAIN POP-UP DISCRETE IN
TERRAIN SELECTED DISCRETE IN
68
81
22
49
37
1B
1A
22
SEE NOTE 1.
NOTES:
1. USE M17/176-0002 SHIELDED WIRE OR 024-00084-0000 QUADRAX CABLE FOR THE 453 DATA BUS AND THE KCPB.
2. REFER TO THE WEATHER RADAR SECTION OF THIS MANUAL FOR THE COMPLETE INTERFACE TO THE BENDIX/KING WEATHER RADARS.
3. THE CATEGORY 6 DISPLAY TYPE ID 10 (INTEGRATED EFIS 40/50) IS THE REQUIRED CONFIGURATION.
THE CATEGORY 13 I/O DISCRETE TYPE ID 1 (LAMP FORMAT 2) IS THE PREFERRED CONFIGURATION.
4. THIS CONFIGURATION IS NOT SUPPORTED PRIOR TO EGPWS COMPUTER PART NUMBERS:
965-1180-020 MARK V/E EGPWS
965-1190-020 MARK V/ EGPWS W/INTERNAL GPS
965-1210-020 MARK VIII EGPWS
965-1220-020 MARK VIII EGPWS W/INTERNAL GPS
NORMAL
DISPLAY DOWN
STANDBY
TERRAIN
ON
ANNUNCIATOR
PRESS-TO-TEST
(MOMENTARY)
TERRAIN INHIBIT
EGPWS FAIL
(ALTERNATE ACTION)
ANNUNCIATOR DIMMER BUS
EGPWS
+28VDC AVIONICS POWER
BENDIX/KING
WEATHER RADAR R/T
453 DATA BUS A OUT
453 DATA BUS B OUT
SEE NOTE 2.
429 CONTROL BUS 1A IN
429 CONTROL BUS 1B IN
MARK V/VI/VII ENHANCED GROUND
PROXIMITY WARNING COMPUTER
NO. 2 DISPLAY RANGE 429 A IN
NO. 1 DISPLAY RANGE 429 A IN
NO. 1 DISPLAY RANGE 429 B IN
NO. 2 DISPLAY RANGE 429 B IN
SEE NOTE 3.
KCPB A OUT
KCPB B OUT
TERRAIN POP-UP OUT
+28V/DC POWER IN
+28V/DC POWER IN
TERRAIN SELECT RELAY OUT
TERRAIN INOP
TERRAIN INHIBIT SWITCH IN
TERRAIN SELECT SWITCH IN
J2
J1
41
37
36
40
58
59
51
60
40
54
55
12
32

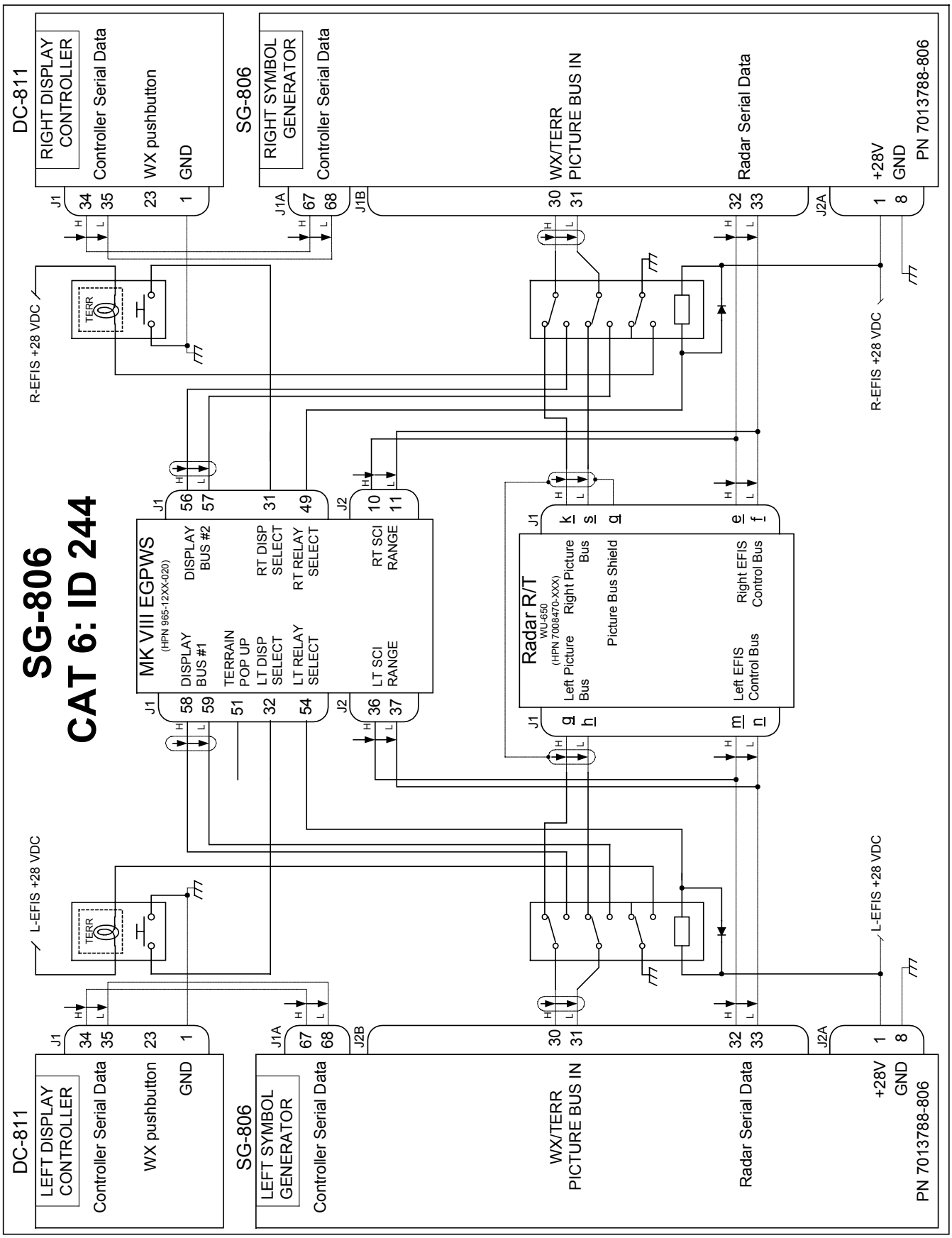

MFD SYMBOL GENERATOR
BENDIX/KING SG 465
R/T TRANSMITTER 429 A OUT
R/T TRANSMITTER 429 B OUT
453 DATA BUS A IN
453 DATA BUS B IN
TERRAIN POP-UP DISCRETE IN
TERRAIN SELECTED DISCRETE IN
P465 2B
68
81
22
49
P465 1B
37
P465 1A
22
SEE NOTE 1.
NOTES:
1. USE M17/176-0002 SHIELDED WIRE OR 024-00064-0000 QUADRAX CABLE FOR THE 453 DATA BUS AND THE KCPB.
2. REFER TO THE WEATHER RADAR SECTION OF THIS MANUAL (3.13) FOR THE COMPLETE INTERFACE TO THE BENDIX/KING WEATHER RADARS.
3. THE CATEGORY 6 DISPLAY TYPE ID 10 (INTEGRATED EFIS 40/50) IS THE REQUIRED CONFIGURATION. THE CATEGORY 13 I/O DISCRETE TYPE ID 1 (LAMP FORMAT 2) IS THE PREFERRED CONFIGURATION.
4. THIS CONFIGURATION IS NOT SUPPORTED PRIOR TO EGPWS COMPUTER PART NUMBERS:
965-1180-020 MARK VI EGPWS
965-1520-020 MARK VI EGPWS W/INTERNAL GPS
965-1210-020 MARK VIII EGPWS
965-1220-020 MARK VIII EGPWS W/INTERNAL GPS
BENDIX/KING
WEATHER RADAR R/T
429 CONTROL BUS 1A IN
429 CONTROL BUS 1B IN
SEE NOTE 2.
453 DATA BUS A OUT
453 DATA BUS B OUT
MARK V/VIII ENHANCED GROUND
PROXIMITY WARNING COMPUTER
J2
J1
NO. 2 DISPLAY RANGE 429 A IN
NO. 1 DISPLAY RANGE 429 A IN
NO. 1 DISPLAY RANGE 429 B IN
NO. 2 DISPLAY RANGE 429 B IN
41
37
36
40
SEE NOTE 3.
KCPB A OUT
KCPB B OUT
58
59
TERRAIN POP-UP OUT
51
+28V/DC POWER IN
+28V/DC POWER IN
60
40
TERRAIN SELECT RELAY OUT
54
TERRAIN INOP
55
TERRAIN INHIBIT SWITCH IN
12
TERRAIN SELECT SWITCH IN
32
EGPWS
+28VDC AVIONICS POWER
ANNUNCIATOR DIMMER BUS
ANNUNCIATOR PRESS-TO-TEST
(ALTERNATE ACTION)
TERRAIN INHIBIT
EGPWS FAIL
TERRAIN
ON
(MOMENTARY)
ANNUNCIATOR PRESS-TO-TEST
ANNUNCIATOR DIMMER BUS

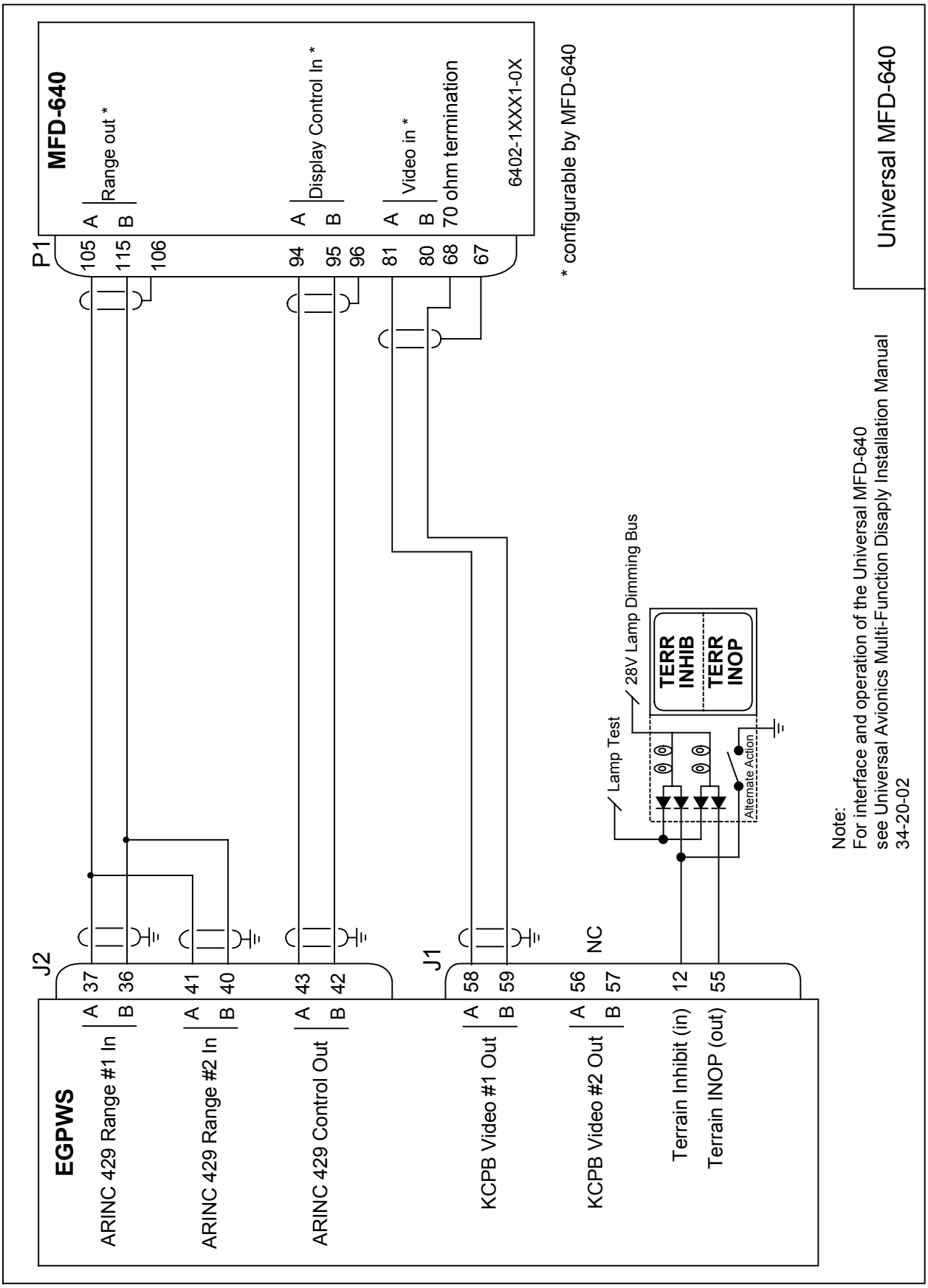

Rockwell Collins
WXI-701/711
WXI-701.vsd
Collins WXI-701
Radar Indicator
A Control Bus A
B
H T/R Data Bus
C 70-ohm termination
L T/R Data Bus
RT On/Off 1
2041222-XXXX
10
11
5
12
6
15
28V EGPWS PWR Bus
Lamp Test
28V Lamp Dimming Bus
Collins WRX R/T
WRT-XXX
J1
?
?
6B
8
9
momentary
TERR
ON
TERR
INHIB
TERR
INOP
Alternate Action
J2
37
36
41
40
J1
58
59
56
57
32
54
12
55
EGPWS
ARINC 429 Range #1 In
ARINC 429 Range #2 In
ARINC 453 Video #1 Out
ARINC 453 Video #2 Out
NC
Terrain Display Select (in)
Terrain Display Select (out)
Terrain Inhibit (in)
Terrain INOP (out)
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.


Collins ProLine II
with WXP-840/850
CollinsP2.vsd
Collins Wx Pnl
WXP-840/850
ARINC 453 Picture
Remote ON
ARINC 429 Range
Collins Wx Pnl
WXP-840/850
ARINC 429 Range
Remote ON
ARINC 453 Picture
28V EGPWS
PWR Bus
Lamp Test
28V Lamp Dimming Bus
28V EGPWS
PWR Bus
To WX R/T
To WX R/T
momentary
momentary
TERR
ON
TERR
ON
EGPWS
J1
J2
J1
Terrain Display Select (out)
ARINC 453 Video #1
Terrain Display Select (in)
ARINC 429 Range #1
ARINC 429 Range #2
Terrain Display Select (in)
ARINC 453 Video #2
Terrain Display Select (out)
Note:
For interface and operation of the Collins Proline II displays see Collins
SIL 2-99
MK VI 965-11X0-020 or later.
MK VIII 965-12X0-020 or later.


HONEYWELL
MK VI-VIII
EGPWS
965-1XXX-0XX
PROLINE 4 INTERFACE
MK VI-VIII EGPWS Category 6, ID 5 or 6
J2
J1
#1 - IOC (ICC-4000)
P1
* ICC-851A pins 13 & 14
RANGE INPUT (A) 37
RANGE INPUT (B) 36
3*
4*
LA-GP-5 bus (Label 271)
#2 - IOC (ICC-4000)
RANGE INPUT (A) 41
RANGE INPUT (B) 40
RA-GP-5 bus (Label 271)
+28 VDC
TERR
70Ω*
* In the OEM installations a single weather radar 453 bus enters the left MFD, passes through, and is terminated (70 ohm) at the right MFD. For EGPWS installations break the 453 radar bus between the MFDs, install switching relays, and wire one relay to each MFD. The right MFD connection is moved to remove the 70 ohm termination at that MFD. To allow proper radar termination when EGPWS is passing through the relays, the radar picture bus has a 70 ohm resistor (added externally).
MOM TERR SELECT #1 32
#1 - MFD
ARINC 453 OUTPUT (A) 58
ARINC 453 OUTPUT (B) 59
8D H - ARINC 453
11D L - (unterminated)
10D L - (70 ohm terminated)
TERR RLY SELECT #1 54
#1 - WXR
4 H
ARINC 453 OUT
29 L
MOM TERR SELECT #2 31
#2 - MFD
ARINC 453 OUTPUT (A) 56
ARINC 453 OUTPUT (B) 57
TERR RLY SELECT #2 49


SG-802/803
CAT. 6: ID 243
DC-810
RIGHT DISPLAY CONTROLLER
Controller Serial Data
WX pushbutton
GND
SG-802
RIGHT SYMBOL GENERATOR
Controller Serial Data
WX/TERR PICTURE BUS IN
Radar Serial Data
+28V
GND
PN 7003400-802
R-EFIS +28 VDC
L-EFIS +28 VDC
TERR
MK VIII EGPWS
(HPN 965-12XX-020)
DISPLAY BUS #1
DISPLAY BUS #2
TERRAIN POP UP
LT DISP SELECT
RT DISP SELECT
LT RELAY SELECT
RT RELAY SELECT
LT SCI RANGE
RT SCI RANGE
CAT 6: ID 243
Radar R/T
WU-650
(HPN 7008470-XXX)
Left Picture Bus
Right Picture Bus
Picture Bus Shield
Left EFIS Control Bus
Right EFIS Control Bus
DC-810
LEFT DISPLAY CONTROLLER
SG-802
LEFT SYMBOL GENERATOR


SG-806
CAT 6: ID 244
DC-811
RIGHT DISPLAY CONTROLLER
Controller Serial Data
WX pushbutton
GND
SG-806
RIGHT SYMBOL GENERATOR
Controller Serial Data
WX/TERR PICTURE BUS IN
Radar Serial Data
+28V
GND
PN 7013788-806
R-EFIS +28 VDC
L-EFIS +28 VDC
TERR
MK VIII EGPWS
(HPN 965-12XX-020)
DISPLAY BUS #1
DISPLAY BUS #2
TERRAIN POP UP
LT DISP SELECT
RT DISP SELECT
LT RELAY SELECT
RT RELAY SELECT
LT SCI RANGE
RT SCI RANGE
Radar R/T
WU-650
(HPN 7008470-XXX)
Left Picture Bus
Right Picture Bus
Picture Bus Shield
Left EFIS Control Bus
Right EFIS Control Bus
DC-811
LEFT DISPLAY CONTROLLER
Controller Serial Data
WX pushbutton
GND
SG-806
LEFT SYMBOL GENERATOR
Controller Serial Data
WX/TERR PICTURE BUS IN
Radar Serial Data
+28V
GND
PN 7013788-806


Universal MFD-640
MFD-640
P1
A
B
105
115
106
Range out *
94
95
96
Display Control In *
81
80
68
67
Video in *
70 ohm termination
6402-1XXX1-0X
* configurable by MFD-640
J2
37
36
41
40
43
42
ARINC 429 Range #1 In
ARINC 429 Range #2 In
ARINC 429 Control Out
J1
58
59
56
57
12
55
KCPB Video #1 Out
KCPB Video #2 Out
NC
Terrain Inhibit (in)
Terrain INOP (out)
EGPWS
Lamp Test
28V Lamp Dimming Bus
TERR INHIB
TERR INOP
Alternate Action
Note:
For interface and operation of the Universal MFD-640
see Universal Avionics Multi-Function Disaply Installation Manual
34-20-02

3.9 Category 7 – Options Select Group #1

Category 7 enables/disables the following Options: Steep Approach, TA&D Alternate Pop Up, Peaks Mode, Obstacle Awareness, Bank Angle, Flap Reversal, and GPS Altitude Reference.

Appendix E *Table 5.3.7* defines the Options Select group and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

3.9.1 Steep Approach

This feature desensitizes the Mode 1 (Excessive Descent Rate) alert boundaries to permit safe but steeper than normal instrument precision approaches (e.g. MLS or GPS approaches) without unwanted Mode 1 alerts.

Category 7 enables Steep Approach mode, Category 13 Steep Approach discrete (J2-31) cockpit switch, activates/deactivates the Steep Approach function during flight.

3.9.2 TA&D Alternate Pop-up

The Display Configuration Group Type (Category 6) defines default and alternate definitions for EGPWS alert "Pop-up" behavior, when no terrain displays are active or when a combination of terrain and non-terrain displays are active. (Some Display Configuration Group Types do not support an Alternate Pop-up definition.) See Appendix E 5.3.6.1-X for definitions.

Category 7 enables/disables TA&D Alternate Pop Up.

3.9.3 Peaks Mode

Peaks mode is an alternate means of displaying terrain data. The standard terrain display mode displays terrain relative to the aircraft altitude that is within the aircraft envelope (the terrain is above or not more than 2000 feet below the aircraft). The standard terrain display mode is typically blank during the cruise portion of a flight. Peaks mode provides increased situational awareness by providing the same information as the standard terrain display mode as well as displaying terrain outside of the aircraft envelope and the highest and lowest elevations of terrain displayed. Peaks mode displays terrain based on the absolute terrain elevations.

Note: TAD and TCF must be enabled if Peaks mode is enabled. The Display Configuration Group (Category 6) defines Peaks Mode availability by defining the effects of enabling and disabling the Peaks Mode enable. See Appendix E 5.3.6.1-X for definitions.

Category 7 enables/disables Peaks Mode.

3.9.4 Obstacle Awareness

The Obstacle Awareness feature adds a database of (man-made) obstacles that are at least 100 feet taller than the surrounding terrain and continuously computes obstacle clearance envelopes ahead of the aircraft, issuing

alerts if the boundaries of these envelopes conflict with obstacle elevation data in the obstacle database (similar to the Terrain Awareness function). Obstacle data is currently available for North America and parts of the Caribbean and Europe. Not all obstacles will be contained in the database.

Category 7 enables Obstacle Awareness if TA&D is not disabled in Category 6.

Note: TAD & TCF must be enabled if Obstacle Awareness is enabled.

3.9.5 Bank Angle Callout Enabling

The Bank Angle feature provides protection for over banking during maneuvering on approach or climb-out and while at altitude. In addition, it protects against wing or engine strikes close to the runway. For airplanes fitted with an autopilot, additional protection is provided if the autopilot is engaged by advancing the roll angle limit to 33 degrees. The additional 'autopilot engaged' protection applies to all software versions for GA FAST and GA SLOW aircraft types, whereas it is available in software version –008 or later for Bizjet aircraft types. The Bank Angle callout can be enabled or disabled as appropriate for this installation.

3.9.6 Flap Reversal

The Landing Flap discrete input is defined in Category 13. The Category 7 control is used to reverse the defined logic to match aircraft wiring, if necessary.

+28 VDC Landing Flap discrete (J1-37) active position:

	Flap Reversal	
Flap Discrete (Category 13)	**False**	**True**
Landing Flap discrete = +28V	Flaps Up	Flaps Down
Landing Flap Discrete = Open (or GND)	Flaps Down	Flaps Up

Ground seeking Landing Flap discrete (J1-18) active position:

	Flap Reversal	
Flap Discrete (Category 13)	**False**	**True**
Landing Flap discrete = GND	Flaps Up	Flaps Down
Landing Flap Discrete = Open (or +28V)	Flaps Down	Flaps Up

3.9.7 GPS Altitude Reference

The GPS Altitude (ARINC 429 label 076, Category 3) may be referenced to mean sea level (MSL) or WGS-84. Determine which reference the GPS position uses and set the GPS Altitude Reference accordingly in this Category.

3.9.8 Instructions

Review the sections above for information on Steep Approach, TA&D Pop Up, Peaks Mode, Obstacle Awareness, Bank Angle, Flap Reversal, and GPS Altitude Reference.
Using Appendix E *Tables 5.2 and 5.3.7* as described above, select the preferred Category 7 (Options Select Group #1) ID that matches the aircraft configuration, features preferences and version (part number) being installed.
Record the ID number for the Options Select Group #1 from Appendix E *Table 5.3.7* under the Ident No. heading for Step (Category) 7 in Appendix E *Table 5.2.*

3.10 Category 8 – Radio Altitude Input Select

Category 8 defines the Radio Altitude and Decision Height interface.

3.10.1 Radio Altitude Input

Appendix E *Table 5.3.8* defines the Radio Altitude Types and identifies the first MK VI/MK VIII EGPWS version in which the option was available (see Effectivity entry).

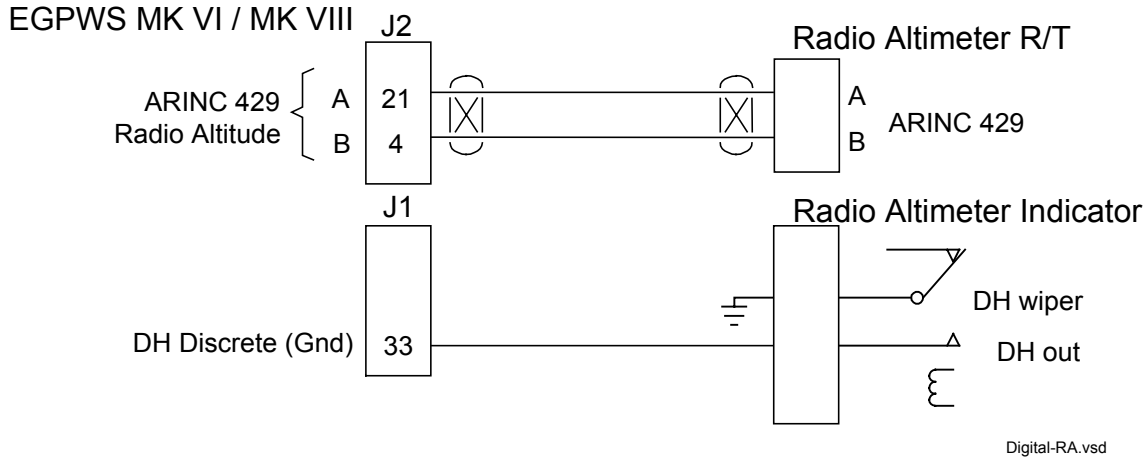
Appendix E Tables 5.3.8-x, where x is the Radio Altitude Type number, define the format and electrical interfaces required to support each Radio Altitude Type.

3.10.2 Decision Height Discrete Input

The Decision Height discrete (J1-33, Category 8) indicates to the MK VI/MK VIII EGPWC whether the aircraft is above or below the selected Decision Height.

This discrete is typically connected to the Decision Height output on the Radio Altimeter indicator. If the 'Minimums-Minimums' callout is not wanted the Decision Height discrete should be left open.

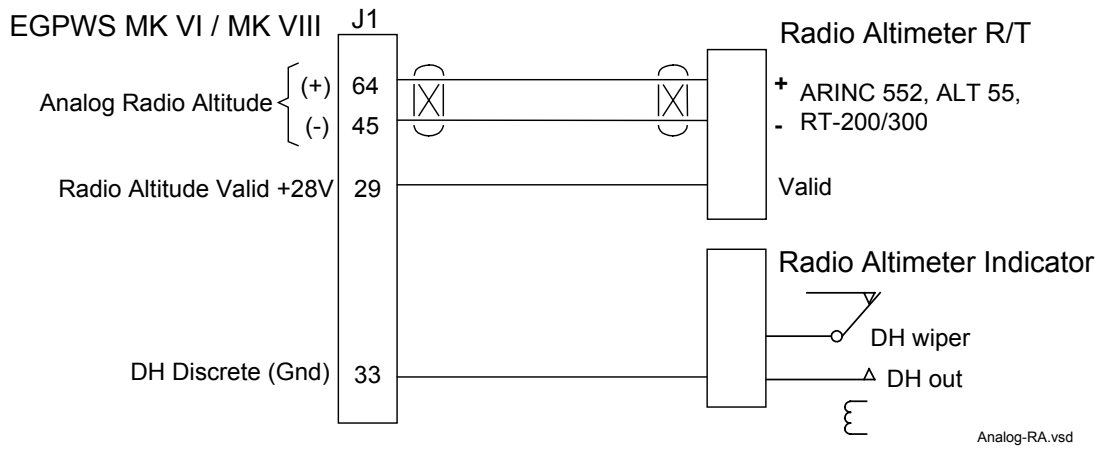
3.10.3 Digital Radio Altitude Interface (Cat. 8 ID 2)



Vendor Model			Ind. DH	R/T	
R/T	Indicator	SCALE	wiper/out	A	B
Collins RAC-870	ALI-55	ARINC 429	P1-R/V	P1-2	P1-3
Honeywell ALA-52A/B		ARINC 429		MP-B2	MP-B3
Honeywell KRA-405B	KNI-415/416	ARINC 429	P1-M/A	P4051-B	P4051-C

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

3.10.4 Analog Radio Altitude Interface (Cat. 8 ID 0,1,3,4)



Vendor Model		Cat.	Ind. DH	R/T		
R/T	Indicator	ID	wiper/out	+	-	Valid
Collins ALT 55	ALI-55	1	P1-R/V	P1-57	P1-59	P1-49
Honeywell HG7502(BC)	JG1072( )	0	P1-e	P4-47	P4-46	P4-27
Honeywell RT-221/300 (1)	RA-315	0	P1-F	P1-X	P1-N	P1-Y
Honeywell RT-220/300 (2)	RA-215	3	P1-F	P1-N	P1-W	P1-Y
Honeywell KRA-405	KNI-415/416	4	P1-M/A	P1-B	P1-g	P1-L
Honeywell KRA-405B	KNI-415/416	4	P1-M/A	P1-j	P1-k	P1-j
Honeywell ALA-51A	INA-51( )	0	P2-e	P1B-47	P1B-46	P1B-27
Collins 860F-1	339H-1/-2	0	P1-e	P1B-47	P1B-46	P1B-27

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

NOTE 1: The following RT-300 part numbers meet ARINC 552 for the Auxiliary Output: 7001840 -902, -906, -912, -916, -917, -918, -922, -926, -928, -932, -936, -937, and -938. RT-221's are also compatible, consult your Honeywell representative.

NOTE 2: This is the Precision Output from the R/T. Note the + and – signals are swapped to convert the –4mV to +4mV. RT-300 (-901, -903, -905) should use the Precision Output, same as RT-220.

3.10.5 Digital – ARINC 429 Dual IOC Buses (Cat. 8 ID 251- 255)

Radio Altitude Type 251 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 164 and 170. Radio Altitude Type 252 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 164 and 370. Radio Altitude Type 253 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having label 164 and a analog discrete DH input. Radio Altitude Type 254 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 164, 170 and 370. Radio Altitude Type 255 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 164 and 370. For interface description see paragraph 3.4.5 Air Data Type 255.

3.10.6 Instructions

Using *Appendix E Tables 5.2, 5.3.8 and 5.3.8-x* as described above, select the Radio Altitude Input Type that matches the aircraft configuration, features preferences and version (part number) being installed.
Record the ID number for the Radio Altitude Type from Appendix E *Table 5.3.8* under the Ident No. heading for Step (Category) 8 in Appendix E *Table 5.2.*
Using the Radio Altitude Type number from Appendix E *Table 5.3.8* as x, go to *Appendix E Table 5.3.8-x.*
The electrical interfaces (pin-outs) for Radio Altitude Type are shown in Appendix E *Table 5.3.8-x* and are used to generate the installation wiring diagrams.

3.11 Category 9 – Navigation Inputs Select

Category 9 selects the Glideslope and Localizer Deviation interfaces and Glideslope Validity and ILS Tuned discretes.

Appendix E Table 5.3.9 defines the Category 9 Navigation Inputs Select options (called Navigation Inputs Select Types) and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E Tables 5.3.9-x, where x is the Navigation Inputs Select Type number, define the format and electrical interfaces required to support each Navigation Input Select Type.

3.11.1 Navigation Inputs Select (Glideslope & Localizer Inputs)

Glideslope Deviation is basic (required) and is available in analog and digital formats. Localizer Deviation is an enhancement (not required).

Note: Numerous (but not all) Envelope Modulation cases require a localizer input. Therefore a NAV ID that supplies both Glideslope and Localizer should be selected in this category if possible. However, due to hardware limitations, use of localizer for installations that can only provide low level validity is not supported. In these cases only ID #1 can be selected. Envelope Modulation will still function for these glideslope only installations, but not for those envelope modulation areas that require a localizer crosscheck.

3.11.2 Glideslope Validity

Glideslope Validity (+28V Super Flag) is required for Navigation Inputs Select 0 or 5 at pin J1-11.

Glideslope Validity (Low Level) is required for Navigation Inputs Select 1 at pins J1-30 (+) and J1-10 (-).

Digital 429 Glideslope interfaces do not require Glideslope Validity input.

3.11.3 Localizer Validity

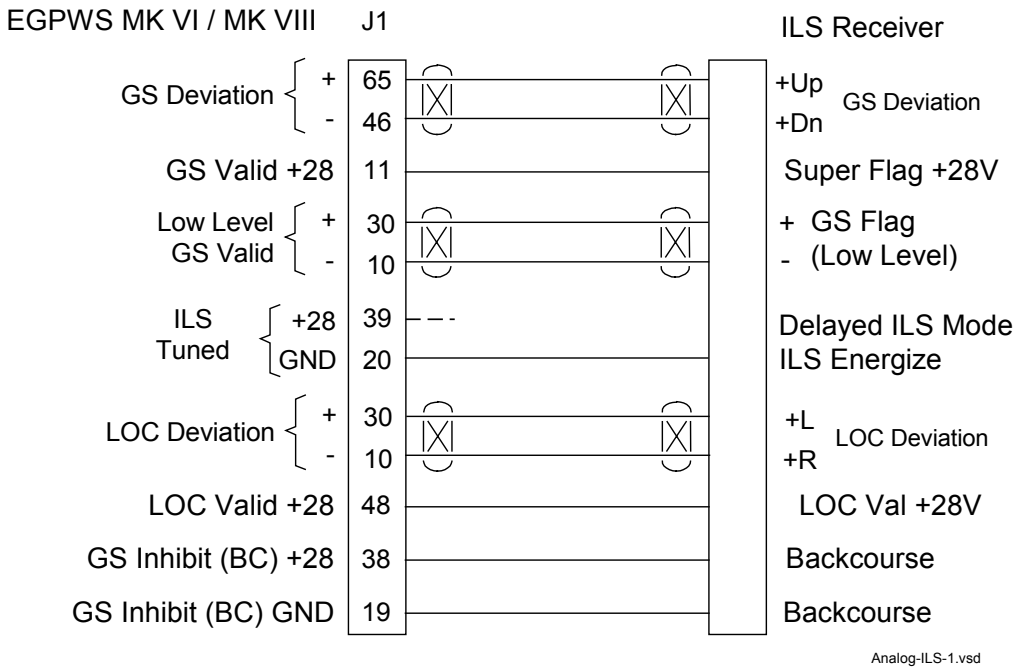
Localizer Validity (+28V Super Flag) is required for Navigation Inputs Select 5 at pin J1-48.

Digital 429 Localizer interfaces do not require Localizer Validity input.

3.11.4 ILS Tuned Discrete Input #1 (+28V) and #2 (GND)

The ILS Tuned Discretes (+28V and GND) indicate that an Instrument Landing System frequency has been selected on the Captain's (or selected) ILS (only one is required). These discretes are used with the analog Glideslope inputs. When an ILS is tuned, the MK VI/MK VIII EGPWS checks the Glideslope Validity discretes and monitors the Glideslope inputs.

3.11.5 Analog Glideslope Interface (Cat. 9 ID 0,1,5)



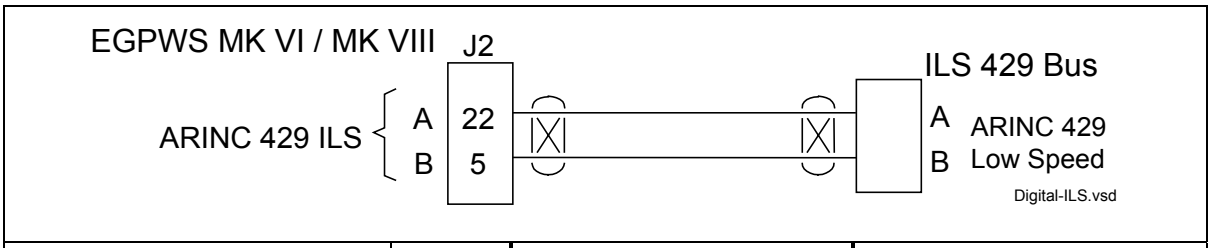
Vendor Model	Cat. 9 ID	GS Valid		LOC Valid	ILS Tuned	Deviation	
		SuperFlag +28V	Low Level Flag	SuperFlag +28V	GND	GS +up +dn	LOC +R +L
Honeywell KNR 6030	5	J1003-27	J1003-21 J1003-22	J1002-50	J1002-18	J1003-8 J1003-9	J1002-39 J1002-40
Honeywell KNR 660	1		P1-e P1-g		P1-k	P1-T P1-V	
Honeywell KNR 634 [1]	5	P6342-50	P6342-34 P6342-18	P6342-49	P6341-17	P6342-36 P6342-35	P6342-23 P6342-7
Honeywell KGM-691	0	P692-W	P692-S P692-T		P692-a	P692-B P692-C	
Honeywell KNR 600A	1		P601-e P601-g	P601-A	P601-k	P601-r P601-s	P601-m P601-n
Collins 51RV-1, 51RV-4( )	5	TP-27 [2]	TP-21 TP-22	BP-50	BP-18	TP-8 TP-9	BP-39 BP-40
Collins VIR-30, -31, -32	5	P1-17	P1-9 P1-13	P2-18	P2-40	P1-5 P1-1	P2-10 P2-13
Honeywell VNS 41A	5	P1001-60		P1001-101	J1001-56	J1001-90 J1001-23	J1001-38 J1001-92
Honeywell RNA-34A	5	TP-27	TP-21	BP-50	BP-18	TP-8 TP-9	BP-39 BP-40
Honeywell KN 53	1		P2-13 P2-R		P2-12	P2-P P2-14	
Honeywell KN 72							P1-2 P1-10
Honeywell RNZ 850	5	P1-A74	P1-B60 P1-B106	P1-B91	P1-B64	P1-B79 P1-B75	P1-B78 P1-B75
Honeywell KX-155/165	1		P901-U P901-R	P401-14	P401-8	P901-S P901-T	P901-s (KX-165) P901-k (only

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. ePlease contact the manufacturer's customer service to confirm your installation.

1 066-1078-00, -01, -04, -05, -10, -11, -14 and –15 only.

2 51RV-4( ) only.

3.11.6 Digital Glideslope / Localizer / ILS Select Interface (Cat. 9 ID 2,3,4)



Vendor Model	Cat 9 ID	ARINC 429 Bus 1		ARINC 429 Bus 2	
		A	B	A	B
Honeywell KNR 634A	2,3	P6342-41	P6342-42	P6342-44	P6342-45
Chelton VNS 411A	2,3	P1-C	P1-D		
Chelton VNS 411B	2,3	P1001-62	P1001-103		
Honeywell RNA-34A	2,3	P1024-24	P1024-28	P1024-21	P1024-25
Honeywell KN 40A(B)	4	P401(403)-41	P401(403)-42	P401(403)-44	P401(403)-45
Collins VIR-432	2,3	P1-35	P1-36	P1-22	P1-23
Garmin GNS-430	2,3	P4006-24	P4006-23		

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

3.11.7 Digital – ARINC 429 Dual IOC buses (Cat. 9 ID 250 - 255)

Navigation Input Select Type 250 - 255 (IOC bus or equivalent) are dual high speed, digital ARINC 429 buses having the following labels:

250	100, 163, 173, and 174	253	173 and 174
251	100, 173, and 174	254	163, 173, and 174
252	173 and 174 *	255	117 and 116

For interface description see paragraph 3.4.5 Air Data Type 255. Note * ID 252 uses a special interface to input channels 2 and 5.

3.11.8 Instructions

Using *Appendix E Tables 5.2, 5.3.9 and 5.3.9-x* as described above, select the Navigation Input Select Type that matches the aircraft configuration, feature preferences, and version (part number) being installed.
Record the ID number for the Navigation Inputs Select Type from Appendix E *Table 5.3.9* under the Ident No. heading for Step (Category) 9 in Appendix E *Table 5.2.*
Using the Navigation Inputs Select number from Appendix E *Table 5.3.9* as “x”, go to *Appendix E Table 5.3.9-x.*
The electrical interfaces (pin-outs) for the Navigation Inputs Select Type are shown in Appendix E *Table 5.3.9-x*) and are used to generate the installation wiring diagrams.

3.12 Category 10 – Attitude Input Select

Category 10 defines the Roll Angle interface.

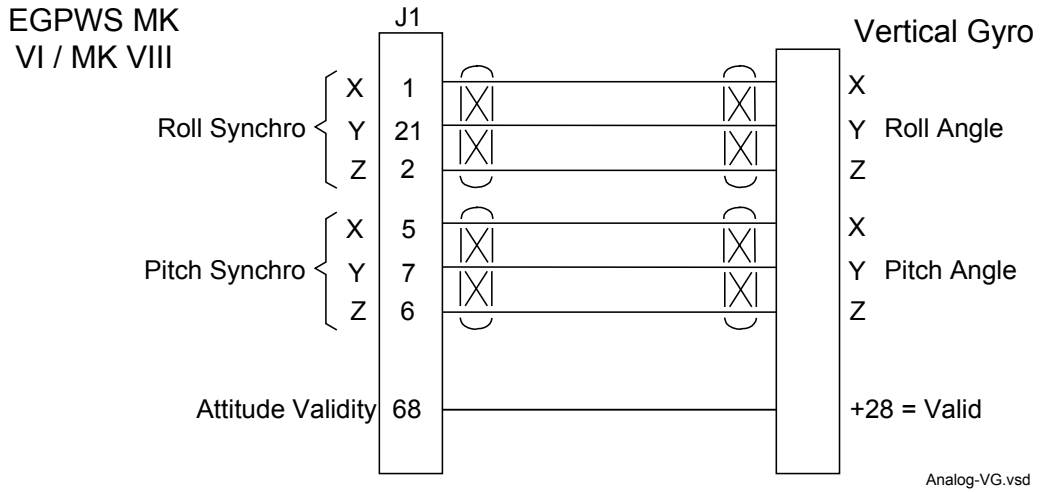
Appendix E Table 5.3.10 defines the Attitude Input Select type and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E Tables 5.3.10-x, where x is the Attitude Input Select Type number, define the format and electrical interfaces required to support each Attitude Input Select Type.

3.12.1 Roll Angle

Roll Angle is used for Bank Angle callout and Terrain Awareness display. Each leg of the Roll Synchro is required. The sign is used to determine left/right wing down. This input improves the TAD look ahead algorithm.

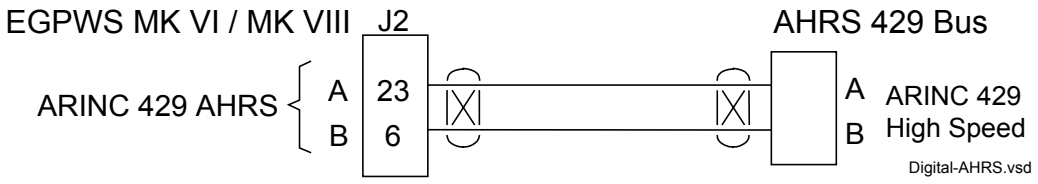
3.12.2 Analog Pitch & Roll Angle (Synchro) (Cat. 10 ID 0,2,4)



Vendor Model Vertical Gyro	Attitude Valid +28	Pitch Synchro (Note 1)			Roll Synchro (Note 1)		
		X	Y	Z	X	Y	Z
Aeronetics RVG 801	P1-U	P1-A	P1-B	P1-C	P1-D	P1-E	P1-F
Collins AHC-85( )	P1-13	P2-50	P2-51	P2-52	P2-42	P2-43	P2-44
Collins 332D-11	P1-N	P1-A	P1-B	P1-C	P1-D	P1-E	P1-F
Honeywell HG1075	J1B-G3	J1B-C9	J1B-C10	J1B-C11	J1B-D9	J1B-D10	J1B-D11
Honeywell HG1095	J1B-G3	J1B-C9	J1B-C10	J1B-C11	J1B-D9	J1B-D10	J1B-D11
JET VG-208	P1-U	P1-A	P1-B	P1-C	P1-D	P1-E	P1-F
King KVG-350	GG/FF	X	Y	Z	P	Q	R
Litef LTR-81	MP-A11	MP-B1	MP-B2	MP-B3	MP-B4	MP-B5	MP-B6
Litef LCR-92 & 93	Note 2	J3-11	J3-40	J3-26	J3-16	J3-39	J3-25
Sperry VG-14A	GG/FF	X	Y	Z	P	Q	R
Sperry VG-311	P1-45	P1-5	P1-4	P1-6	P1-7	P1-8	P1-9

Note 1: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.
Note 2: See LCR installation manual.

3.12.3 Digital Pitch & Roll Angle (ARINC 429 High Speed) (Cat. 10 ID 5 & 6)



Vendor Model	Cat 10 ID	ARINC 429 Bus 1		ARINC 429 Bus 2	
		A	B	A	B
Collins AHC-85(D/E only)	6*	P1-16	P1-14	P1-24	P1-22
Litef LTR-81 AHRS	6*	MP-G7	MP-G8	MP-E5	MP-E6
Litef LCR-92/LCR-93 AHRS	6*	J4-08	J4-29	J4-49	J4-07
Honeywell HG1075/1095 IRU	6*	J1B-G7	J1B-G8	J1B-E5	J1B-E6

NOTE: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

* ID 6 is preferred with Category 2 Air Data with ARINC 429 Barometric Altitude Rate (label 212), otherwise ID 5. ID 6 cannot be used with analog Air Data interfaces.

3.12.4 Digital – ARINC 429 Dual IOC buses (Cat. 10 ID 253 & 255)

Attitude Input Select Type 253 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 324, 325, 326, 327, 365 and 361. Attitude Input Select Type 255 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 324, 325, 333 and 331. For interface description see paragraph 3.4.5 Air Data Type 255.

3.12.5 Instructions

Using *Appendix E Tables 5.2, 5.3.10 and 5.3.10-x* as described above, select the Attitude Input Select type that matches the aircraft configuration, feature preferences, and version (part number) being installed.
Record the ID number for the Attitude Input Select from Appendix E *Table 5.3.10* under the Ident No. heading for Step (Category) 10 in Appendix E *Table 5.2.*
Using the Attitude Input Select ID number from Appendix E *Table 5.3.10* as "x", go to *Appendix E Table 5.3.10-x.*
The electrical interfaces (pin-outs) for the Attitude Input Select Type are shown in Appendix E *Table 5.3.10-x* and are used to generate the installation wiring diagrams.

3.13 Category 11 – Heading Input Select

Category 11 defines the Magnetic Heading interface.

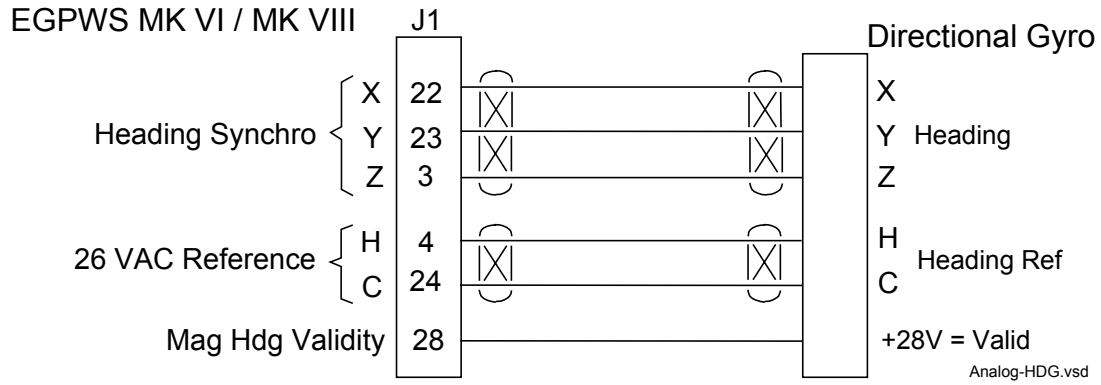
Appendix E Table 5.3.11 defines the Heading Input Select types and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

Appendix E Tables 5.3.11-x, where x is the Heading Input Select number, define the format and electrical interfaces required to support each Heading Input Select Type.

3.13.1 Magnetic Heading

Magnetic Heading is used for Terrain Awareness alert and display.

3.13.2 Analog Heading (Synchro) (Cat. 11 ID 0)



Vendor Model Directional Gyro	Heading Valid	Heading Reference		Heading Synchro (Note 1)		
		H	C	X	Y	Z
Aeronetics Model 9100	P1-28	P1-6	P1-7	P1-8	P1-9	P1-10
Collins 332E-4	P1-F	P1-D	P1-E	P1-A	P1-B	P1-C
Collins AHC-85( )	P1-9	P2-57	P2-58	P2-34	P2-35	P2-36
Collins DGS-65	P1-50	P1-6	P1-3	P1-25	P1-40	P1-24
Honeywell HG1075/1095	J1B-G2	J1B-F13	J1B-G13	J1B-E10	J1B-E11	J1B-E12
Honeywell KSG 105	P1-V	P1-P [1] P1-C [2]	P1-D [1] P1-F [2]	P1-Z [1] P1-T [2]	P1-W [1] P1-P [2]	P1-T [1] P1-K [2]
Honeywell KI-525 [3](KG-102)	J2-P	J2-R	J2-U	J2-S	J2-V	J2-T
JET DN-104	P2-31	P2-9	P2-10	P2-1	P2-2	P2-3
Litef LTR-81	MP-E15	MP-B12	MP-B13	MP-B9	MP-B10	MP-B11
Litef LCR-92/LCR-93	Note 2	J3-05	J3-20	J3-13	J3-42	J3-28
Sperry C-14A[3]	P1-e	P1-H [1]	P1-J [1]	P1-L [1]	P1-M [1]	P1-K [1]
Sperry C-14D[3]	P1-DD	P1-X	P1-Y	P1-AA	P1-BB	P1-Z
Sperry DG-234	P2-F			P1-L	P1-K	P1-J
Sperry DG-207	J1-B	J1-C(115VAC)	J1-M	P1-L	P1-K	P1-J

Note 1: The connector pin numbers given in the Table above are to the best knowledge of Honeywell EGPWS engineering. Please contact the manufacturer's customer service to confirm your installation.

Note 2: See LCR installation manual.

1 #1 Heading Output

2 #2 Heading Output
3 Do not use #2 output, reserved for autopilot only.

Note 3: The KI-525 must have the proper mod for HEADING TRANSMITTER output. The Heading valid output at J2-P needs to be converted from ground active output to +28V active output using a external relay for use with EGPWS.

3.13.3 Digital – ARINC 429 AHRS Input (Cat. 11 ID 2 & 3)

Heading Input Select Type 2 (AHRS bus or equivalent) is a high speed, digital ARINC 429 signal having label 320. Heading Input Select Type 3 (AHRS bus or equivalent) is a high speed, digital ARINC 429 signal having labels 320 and 314. For interface description see paragraph 3.12.3 Attitude Input Type 5.

3.13.4 Digital – ARINC 429 Dual IOC buses (Cat. 11 ID 254 & 255)

Heading Input Select Type 254 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having label 314. Heading Input Select Type 255 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having label 320. For interface description see paragraph 3.4.5 Air Data Type 255.

3.13.5 Instructions

Using *Appendix E Tables 5.2, 5.3.11 and 5.3.11-x* as described above, select Heading Input Select type that matches the aircraft configuration, feature preferences, and version (part number) being installed.
Record the ID number for the Heading Input Select from Appendix E *Table 5.3.11* under the Ident No. heading for Step (Category) 11 in Appendix E *Table 5.2.*
Using the Heading Input Select number from Appendix E *Table 5.3.11* as “x”, go to *Appendix E Table 5.3.11-x.*
The electrical interfaces (pin-outs) for the Heading Input Select Type are shown in Appendix E *Table 5.3.11-x* and are used to generate the installation wiring diagrams.

3.14 Category 12 – Windshear Input Select

Category 12 defines the Windshear interface.

Appendix E Table 5.3.12 defines the Windshear Input Select options and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

3.14.1 No Windshear

Select ID 0 (No Windshear) for all aircraft configurations without Windshear. Windshear options will be added as new installations types are propagated.

3.14.2 Dual ARINC 429 BUS (Cat. 14 ID 253,254,255)

Windshear Input Select Types 253, 254 and 255 (IOC bus or equivalent) is a dual high speed, digital ARINC 429 signal having labels 224, 225 and 236. For interface description see paragraph 3.4.5 Air Data Type 255.

NOTE: Windshear is currently available only for Bombardier Challenger 300 airplanes with MK VIII EGPWS installations.

3.14.3 Instructions

Using *Appendix E Table 5.2 and 5.3.12* as described above, select the Windshear Input Select type that matches the aircraft configuration, feature preferences and version (part number) being installed.
Record the ID number for the Windshear Input Select from Appendix E *Table 5.3.12* under the Ident No. heading for Step (Category) 12 in *Appendix E Table 5.2.*

3.15 Category 13 – Input / Output Discrete Type Select

Category 13 defines the input and output discretes not defined as part of any of the other Categories.

Appendix E Table 5.3.13 defines the Input/Output discretes options and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

3.15.1 Input Discretes

The discrete inputs are defined in Appendix E *Section 6.6* Additional information for the discretes is provided below.

Note: When there are two discrete pin choices for the same pin function in Appendix E *Table 5.3.13-x*, use only the one that matches the aircraft wiring either +28V or Ground.

3.15.1.1 Glideslope Inhibit Discrete

The Glideslope Inhibit discrete is used for Backcourse Inhibit of Mode 5 Glideslope. Either the +28V (J1-38) discrete or the ground (J1-19) discrete may be used. If Backcourse is not available these discretes may be left open.

Discrete	Position / Status	Connector Pin
Glideslope Inhibit +28	Inhibit = +28V Not Inhibit = Gnd/Open	J1-38
Glideslope Inhibit Gnd	Inhibit = Gnd Not Inhibit = +28V /Open	J1-19

3.15.1.2 Landing Flaps Discrete

Landing Flap discrete is supplied by a Flap or Flap handle switch. The active position (+28V or GND) indicates “Not Landing Flaps” (or Flaps Up) and should be connected to a contact that will indicate Flaps Up until the Flaps are lowered to landing position prior to landing. The Landing Flap discrete active position can be reversed by the ‘Flap Reversal Option’ of Appendix E *Table 5.3.7* as shown in the following tables. Flap Override for MK VIII EGPWS can be done by a guarded (or illuminated) cockpit switch that simulates the Flap Down condition.

+28 VDC Landing Flap discrete active position:

Flap Discrete (J1-37)	**Flap Reversal (Category 7)**	
	False	**True**
Landing Flap discrete = +28V	Flaps Up	Flaps Down
Landing Flap Discrete = Open (or GND)	Flaps Down	Flaps
Cat. 13 ID 254/255 only *		
Flap Override = OVRD	+28V	+28V
Flap Override = NORM	Open	Open

* Category 13 ID 254/255 must use this method for Flap Override.

Ground seeking Landing Flap discrete active position:

Flap Discrete (J1-18)	Flap Reversal (Category 7) False	Flap Reversal (Category 7) True
Landing Flap discrete = GND	Flaps Up	Flaps Down
Landing Flap Discrete = Open (or +28V)	Flaps Down	Flaps
Cat. 13 ID 254/255 only *		
Flap Override = OVRD	GND	GND
Flap Override = NORM	Open	Open

* Category 13 ID 254/255 must use this method for Flap Override.

3.15.1.3 Audio Inhibit Discrete

The Audio Inhibit discrete is an optional input but is strongly recommended to maintain audio and visual prioritization. When activated, this discrete inhibits all audio (Ground Proximity and Terrain Awareness). Activation of the Audio Inhibit input for more than 60 seconds will result in the “All Modes Inhibit” fault.

The Audio Inhibit discrete input can be connected to any or all of the following (as applicable to the aircraft configuration):

- the Stall Warning computers (this is required for CAA-registered aircraft)
- the Predictive Windshear (PWS) Audio Inhibit output discrete
- a separately labeled guarded cockpit switch
- the reactive Windshear system if separate from the EGPWS.

For some existing GPWS installations, this discrete may have been tied to the analog Radio Altimeter Receiver-Transmitter Self-Test output. This connection is no longer required but may be left intact for retrofit installations.

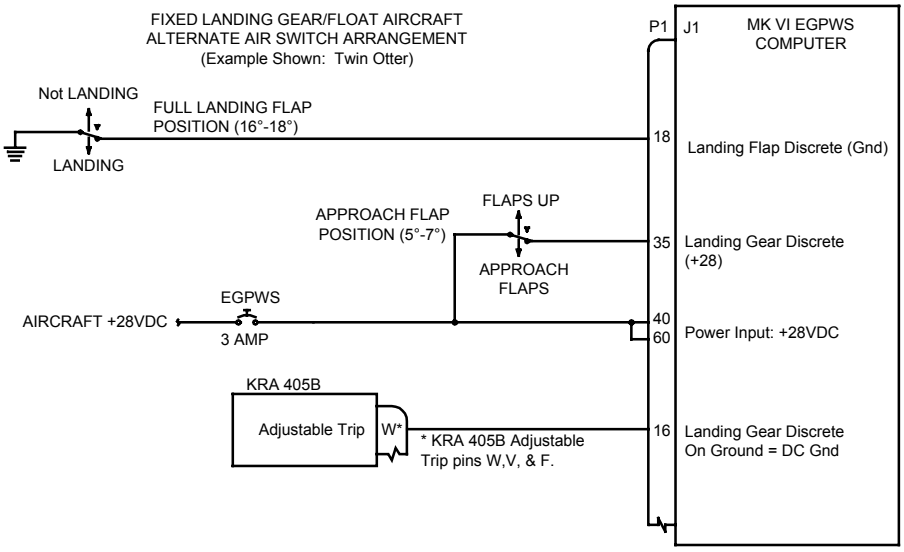
Discrete	Position / Status	Connector Pin
Audio Inhibit +28	Inhibit = +28V Not Inhibit = Gnd/Open	J1-36
Audio Inhibit Gnd	Inhibit = Gnd Not Inhibit = +28V /Open	J1-17

3.15.1.4 Landing Gear Discrete

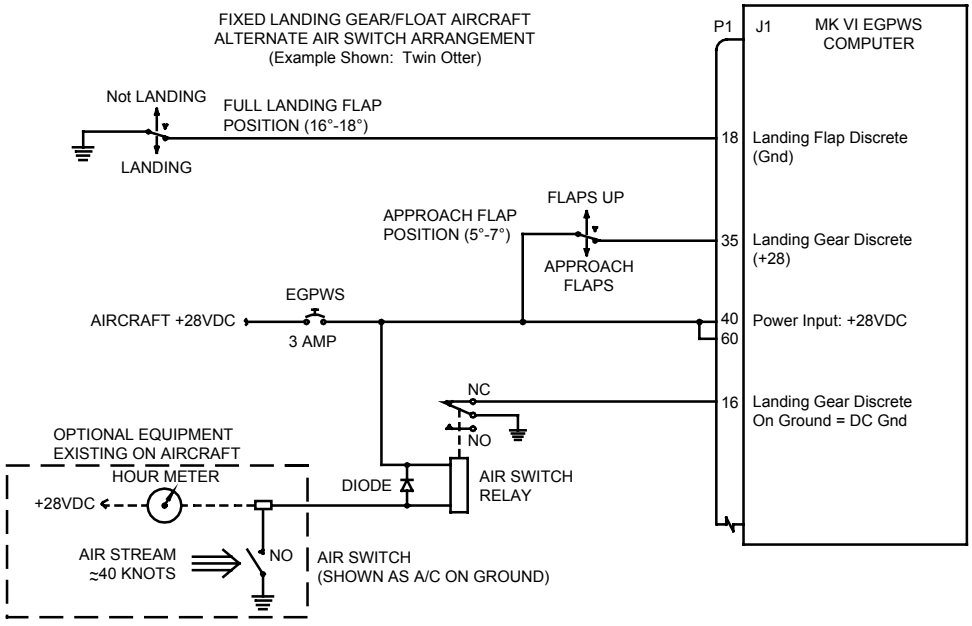
Landing Gear discrete is supplied by the Gear (or Gear handle) switch. The active position (+28V or GND) indicates “Gear Down” and should be connected to a contact that will indicate Gear Down when the Gear are lowered prior to 500 feet Radio altitude.

Discrete	Position / Status	Connector Pin
Landing Gear +28	Down = +28V Not Down = Gnd/Open	J1-35
Landing Gear Gnd	Down = Gnd Not Down = +28V /Open	J1-16

For Fixed Gear aircraft the Audio Menu in Category 5 should be ID 2 or 3 and one of the following Gear Discrete arrangements should be used to simulate Gear Down to the EGPWS.



The Honeywell KRA 405B provides 3 programmable Adjustable Trip outputs that can be used to supply a ground to the Landing Gear input discrete when the aircraft is less than 5 to 20 feet Radio Altitude. See the Honeywell KRA 405B Installation Manual (006-10536-0003) for details of the Adjustable Trip output. Use of Adjustable Trip outputs of the KRA 405B requires CM2000 Configuration Module along with KPA900 Configuration Module Programmer, PC and software. The Collins ALT-55 (622-2855-001 only) also provides 4 shop adjustable Trip outputs, pins 41,43,46, and 48, contact Collins Avionics for details.



Some aircraft (ex: Twin Otter) have an air switch (flapper on the wing) that can be used to provide a Landing Gear discrete ground when the aircraft is less than approximately 40 knots airspeed (approach airspeed varies by aircraft). Contact Honeywell EGPWS engineering for assistance in adapting this discrete input design to your aircraft.

3.15.1.5 Glideslope Cancel Discrete

The Glideslope Cancel discrete provides the crew with the capability to manually cancel Mode 5 alerts during an approach. The Glideslope Cancel latch is automatically reset when the aircraft descends below 30 feet or ascends above 2000 feet or by selecting a non-ILS frequency.

This discrete is typically supplied by a momentary action cockpit Glideslope mode manual inhibit switch, typically part of the Glideslope Lamp assembly (Below GS).

Discrete	Position / Status	Connector Pin
Glideslope Cancel	Cancel = Gnd Normal = Open	J1-15

3.15.1.6 Momentary Flap Override Discrete

The Momentary Flap Override discrete provides the crew with the capability to manually desensitize mode 4 of the EGPWS when the pilot must land with flaps up or partial flaps. For Category 1 GA Fast and GA Slow aircraft only, the Flap Override will also bias mode 1 by –300 fpm during operations at airports located in terrain where steep or incompatible terrain clearances are involved. Honeywell recommends the installation of the momentary Flap Override switch. Category 13 ID's 254 & 255 do not support this function (see 3.15.1.2).

This feature is activated by momentarily pressing a light switch located in the cockpit within sight of each pilot. When Flap Override is selected and active, the EGPWS will illuminate a 'GPWS FLAP OVRD' light (J1-73) (see 3.14.2.8) to remind the pilots that this feature has been activated. After landing, both the function and the light will automatically reset to the OFF condition. The Flap Override function and light can also be manually deactivated in flight by again pressing the light switch. Each pressing of the light switch during flight will alternate the ON/OFF state of this function (minimum of 5 seconds between presses).

The use of the Flap Override switch will be controlled by the Operator's (Air Carrier/Airline) Operational Procedures.

Discrete	Position / Status	Connector Pin
Flap Override	OVRD Toggle = Gnd Normal = Open	J1-14

3.15.1.7 Mode 6 Low Volume Discrete

The Mode 6 Low Volume discrete permanently or temporarily modifies the volume of the Mode 6 altitude and bank angle callouts. This discrete operates independent of the Category 14 options.

The Mode 6 Low Volume discrete is used to reduce the Mode 6 volume by 6dB from the volume level select in Category 14.

This discrete is typically connected to ground to lower the volume an additional 6dB. In some installations, it is connected to the windshield wiper control to decrease the Mode 6 Volume level under normal conditions and automatically increase Mode 6 volume 6dB when the cabin noise increases due to the windshield wipers being on.

Discrete	Position / Status	Connector Pin
Mode 6 Low Volume	Low Volume = Gnd Not Low Volume = Open	J1-13

3.15.1.8 Autopilot Engaged Discrete

For airplanes fitted with an Autopilot, additional Bank Angle mode protection is provided when the Autopilot is engaged. If the Autopilot is engaged the Bank Angle roll angle limit advances to 33 degrees from 50 degrees.

This input discrete should be connected to a +28V active (engaged) output discrete from the Autopilot system that indicates the Autopilot has authority over the controls of the aircraft. For aircraft with Touch Control Steering, the input should be connected to the clutch engaged output discrete.

Discrete	Position / Status	Connector Pin
Autopilot Engaged	Engaged = +28V Not Engaged = Open	J1-8

3.15.1.9 Terrain Awareness and TCF Inhibit Discrete

The Terrain Awareness and TCF Inhibit discrete inhibits the Terrain Awareness and TCF modes of the MK VI/VIII EGPWS. **This discrete is required for all installations that do not disable TA&D and TCF in Category 6.**

This discrete is typically connected to an “alternate action switch” in the cockpit. The recommended label for this switch is “Terrain Override” although labeling for this switch should be consistent with existing cockpit nomenclature.

“Terrain Inhibited” will be annunciated during cockpit Self-Test if these functions are inhibited.

Discrete	Position / Status	Connector Pin
TA & TCF Inhibit	Inhibit = Gnd Not Inhibit = Open	J1-12

3.15.1.10 Self Test Discrete

The cockpit Self Test discrete is provided to manually initiate test of the EGPWC, EGPWS aircraft interface, and to enunciate system configuration and status information. This discrete is typically supplied by a momentary action cockpit ‘push to test’ switch, typically part of the GPWS WARN Lamp assembly.

This discrete must be momentarily connected to ground to activate the Self Test. Activation of this discrete continuously for more than 60 seconds will result in the ‘Self Test Invalid’ fault which will cause a GPWS INOP indication.

Discrete	Position / Status	Connector Pin
Self Test	Self Test = Gnd Normal = Open	J1-34

3.15.1.11 Steep Approach Discrete #2

For some installations a Steep Approach bias can be optionally applied to the Mode 1 curves. If Steep Approach is enabled (Category 7) and the Steep Approach discrete is selected (Category 13), then fixed positive biases are added to both the Sinkrate curve (500 fpm), and the Pull Up curve (200 fpm).

Category 7 enables the Steep Approach function for the installation. Steep Approach is activated using the Steep Approach discrete. Steep Approach discrete #2 is selected in flight when starting a steep approach. Steep Approach discrete #2 should not be hardwired. **On ground self-test is inhibited if Steep Approach is active.**

Momentary action (Category 13, ID's 6 and 7 only)

Discrete	Position / Status	Connector Pin
Steep Approach	Steep Approach Toggle = Gnd Normal (no action) = Open	J2-31

Alternate action (Category 13, all ID's except ID 6 and 7)

Discrete	Position / Status	Connector Pin
Steep Approach	Selected = Gnd Not Selected = Open	J2-31

Momentary action (preferred method) enables a (non-latching) cockpit switch. Reference 3.15.2.9 Steep Approach Discrete for associated lamp output. The Steep Approach output lamp activates when the switch is pressed or when Envelope Modulation automatically activates steep approach and deactivates on landing.

3.15.1.12 GPWS INHIBIT Discrete (alternate action)

The GPWS INHIBIT discrete inhibits the GPWS modes of the MK VI/VIII EGPWS (all audio and visual except for WS, TA & TCF). This discrete is typically connected to an "alternate action switch" in the cockpit. The recommended label for this switch is "GPWS INHIBIT" although labeling for this switch should be consistent with existing cockpit nomenclature. Activation of this switch for more than 5 seconds will result in a GPWS INOP indication.

Discrete	Position / Status	Connector Pin
GPWS INHIBIT	Inhibit = Gnd Normal = Open	J1-67

3.15.2 Output Discretes

The discrete outputs are defined in *Appendix E Section 7.4*. The MK VI/VIII EGPWS supports two kinds of Ground/Open discrete outputs used to indicate various conditions. Monitor outputs are used to indicate failure conditions for the EGPW system. Monitor outputs default to an active state when there is a failure or if power is removed from the EGPWS (no connection if the EGPWC is removed from the rack). The Discrete Out Lamp driver outputs are used to indicate alert modes (GPWS WARN, BELOW GS, etc.) or mode control status (FLAP OVRD, Terrain Display Select, etc.) of the EGPWS.

Short-term current limit protection is provided on all drivers for output shorting conditions. Ground going output discretes may be connected together to produce a 'wired OR' function for the active low state of the outputs. If output discretes are 'wire OR'd' then diodes must be installed for isolation. **Output discretes are intended to operate with +28 VDC lamp sources and will not operate with +5 VDC lamp sources.**

3.15.2.1 Lamp Format

The Lamp Format Type (configuration) is a function of the discrete output pin functions and defines the operation of the red and amber GPWS cockpit lamps.

For Lamp Format Type 1, the amber "Below G/S" lamp is driven by the GPWS Alert (Glideslope only) discrete and the red "GPWS" lamp is driven by the remaining alerts and warnings.

For Lamp Format Type 2, the red "GPWS" lamp is driven by the GPWS Warning (Pull Up, Terrain Pull Up, and Obstacle Pull Up only) discrete and the amber "GPWS" lamp is driven by the remaining alerts and warnings.

Note: Lamp Format 2 is highly recommended by Honeywell. As of April 2002 the FAA position paper on Lamp Format is in draft form, the FAA may require that all new installation of EGPWS use Lamp Format 2.

3.15.2.2 Flashing Lamps

The Flashing Lamps option is configurable as a function of the discrete output pin functions and defines the operation of the red and amber GPWS cockpit lamps. If the Flashing Lamps option is selected, both the red and amber GPWS cockpit lamps will flash when they are illuminated, if Flashing Lamps is not selected, they will be illuminated as steady lights.

3.15.2.3 GPWS INOP Discrete

The GPWS INOP discrete (J1-72) indicates GPWS modes are inoperative. This feature activates a 'GPWS INOP" lamp located in the cockpit within sight of the pilots.

3.15.2.4 TAD INOP Discrete

The TAD INOP discrete (J1-55) indicates Terrain Clearance Floor (TCF), Terrain Awareness (TA), and Terrain Display are 'Not Available'. This feature activates a 'TERRAIN NOT AVAILABLE" lamp located in the cockpit within sight of the pilots.

3.15.2.5 GPWS Warning Discrete

(Lamp Format Type 1 definition)
GPWS Warning discrete (J1-78) will activate during any Mode 1 through Mode 4 alert or warning, Terrain Awareness caution/warning, or Obstacle Awareness caution/warning. This feature activates a 'GPWS' lamp located in the cockpit within sight of each pilot. Note that Mode 6 does not activate any lamp outputs, only voices.

(Lamp Format Type 2 definition)
GPWS Warning discrete (J1-78) will activate during any Mode 1 or 2 Pull Up warning, Terrain Awareness warning, or Obstacle Awareness warning. This feature activates a 'GPWS' lamp located in the cockpit within sight of each pilot.

3.15.2.6 GPWS Alert Discrete

(Lamp Format Type 1 definition)
GPWS Alert discrete (J1-77) will activate during Mode 5 Glideslope cautions only. This feature activates a 'BELOW GS' amber lamp located in the cockpit within sight of each pilot.

(Lamp Format Type 2 definition)
GPWS Alert discrete (J1-77) will activate during any Mode 1 Sinkrate, Mode 3 Don't Sink, Mode 4 Too Low Gear, Too Low Flaps, Too Low Terrain, Mode 5 Glideslope, Terrain Awareness caution, or Obstacle Awareness caution. This feature activates a 'GPWS' amber lamp located in the cockpit within sight of each pilot.

3.15.2.7 Glideslope Cancel'd Discrete

-Optional- Glideslope Cancel'd discrete (J1-76) will activate when the Glideslope Cancel discrete (momentary) has been pressed any time below 2000 feet Radio Altitude if the ILS is tuned. This feature activates a 'G/S CANCLD" amber lamp located in the cockpit within sight of the pilots.

3.15.2.8 Flap Override Discrete

-Optional- Flap Override discrete (J1-73) will activate after either pilot has initiated the manual selection of the Flap Override (momentary) discrete. This feature activates a 'GPWS FLAP OVRD" blue lamp located in the cockpit within sight of the pilots. The lamp serves to remind the flight crew that this function is active.

3.15.2.9 Steep Approach Discrete

Steep Approach discrete (J1-52) will activate when the Steep Approach discrete (momentary action) has been pressed. This feature activates a "STP APR" amber lamp located within sight of the pilots.

3.15.2.10 Audio On Discrete (TCAS/TAS Inhibit)

-Optional- Audio On discrete (J1-69) will activate during any EGPWS voice annunciation. This output is used to inhibit other systems (such as TCAS or TAS) from talking during EGPWS annunciation. This feature does not have a lamp associated with it.

TCAS/TAS		Connector
Vendor Model	Function	PIN #
Honeywell CAS-81, TCAS II, TPA-81A	TA Only Inhibit Audio	RBP-5C RBP-5D
Collins TTR-920, TCAS II	TA Only Inhibit Audio	RBP-5C RBP-5D
CAS 66, 67	Standby Inhibit Audio	P1A-17 P1A-18
Goodrich* Skywatch HP (SKY899) Skywatch (SKY497) TCAS I (TCAS791/A)	Inhibit Audio	P1-34 P1-32 P1-9

* Interface with the Goodrich Skywatch TAS requires a +28V pullup resistor in the aircraft wiring as shown in Figure 3.15-1 below.

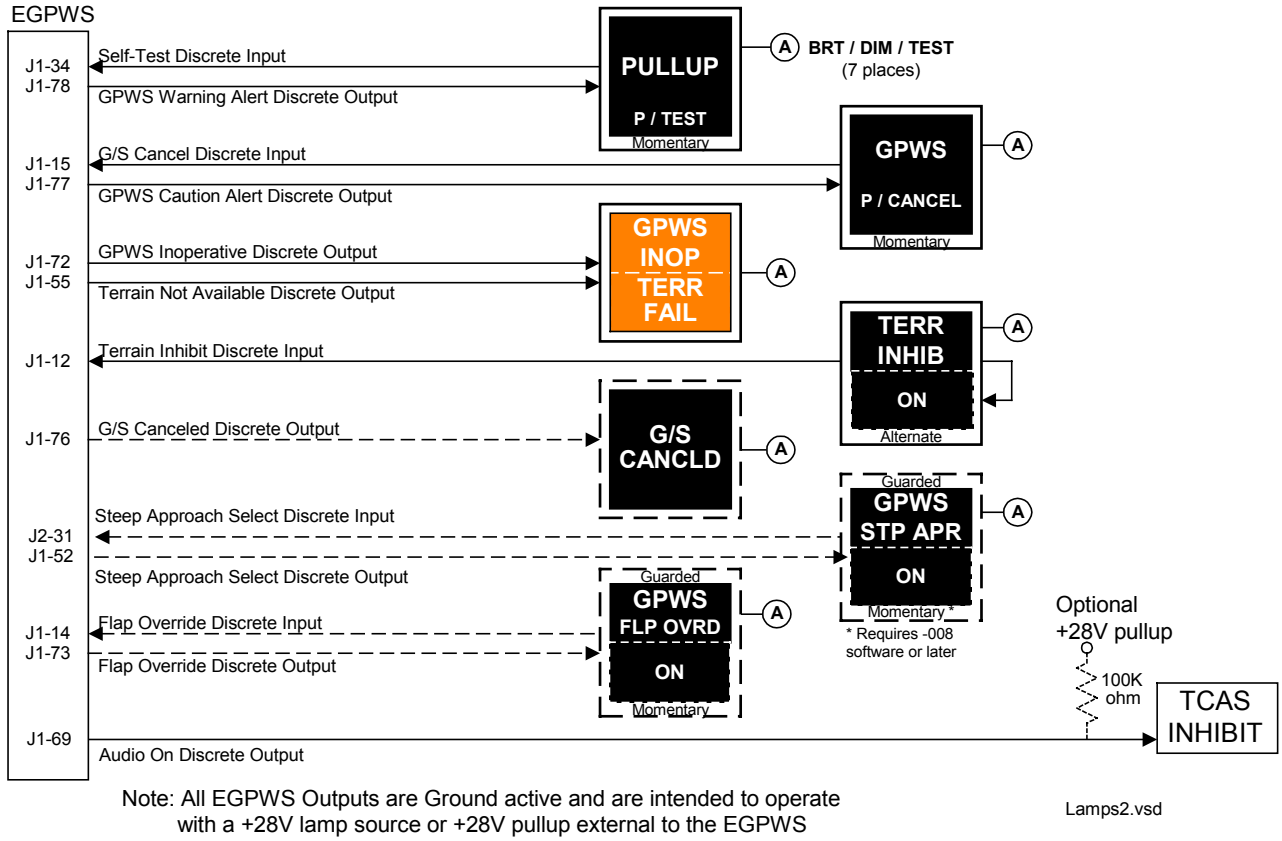


FIGURE 3.15-1 Example of Light/switch Interface (Lamp Format 2)

3.15.2.11 Terrain Display Select #1 & #2 Discrete

Terrain Display Select #1 & #2 discrete (J1-54 & J1-49) will activate after the related pilot has initiated manual selection of the Terrain Display Select (momentary) discrete #1 or #2 (J1-32 & J1-31, Category 6). This feature activates a 'TERR" white lamp located in the cockpit within sight of each pilot. The lamp serves to remind the flight crew that this function is active. The select switches (J1-32 & J1-31) and the indicator lamps (J1-54 & J1-49) are commonly combined in switch-lamp assemblies mounted near the displays being selected.

3.15.2.12 Terrain Pop up Discrete

Terrain Pop Up discrete (J1-51) will activate when a Terrain/Obstacle Caution or Warning alert event has occurred. This feature activates the pop up in an integrated display or will switch a relay to pop up Terrain display over selected weather radar display. The Pop Up discrete can be used by a display system to differentiate between a manual Terrain display selection or Terrain display selection due to a Terrain/Obstacle Caution or Warning alert event.

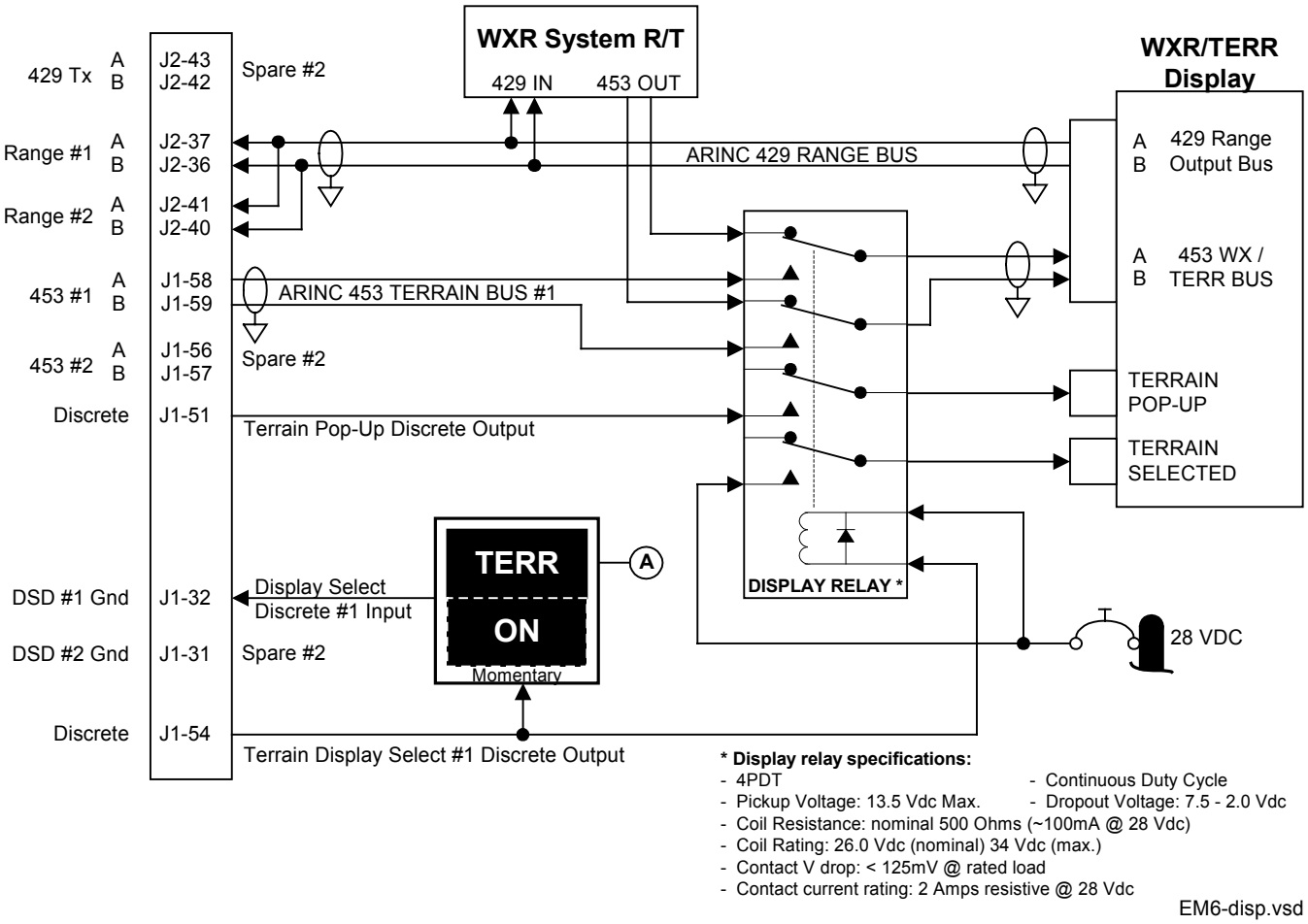


FIGURE 3.15-2 Example of Terrain Display Interface

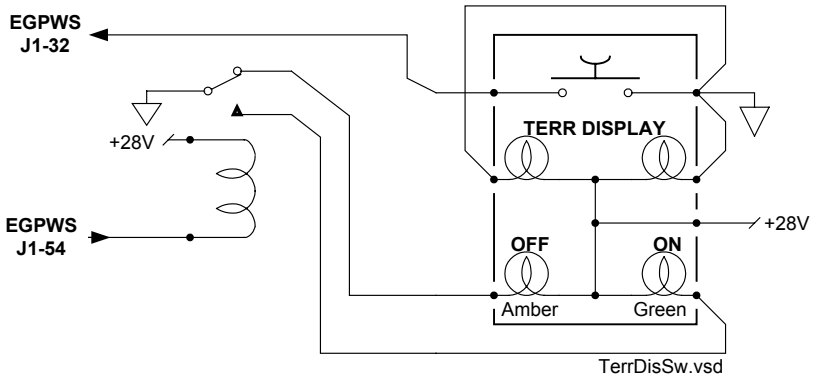


Figure 3.15-3 Example of Terrain Display switch with relay

3.15.3 Instructions

Using Appendix E *Tables 5.2, 5.3.13 and 5.3.13-x* as described above, select the Input/Output Discrete Type number that matches the aircraft configuration, feature preferences and version (part number) being installed.
Record the ID number for the Input/Output Discrete Select number from Appendix E *Table 5.3.13* under the Ident No. heading for Step (Category) 13 in Appendix E *Table 5.2.*
Using the Input/Output Discrete Type number from Appendix E *Table 5.3.13* as "x", go the Appendix E *Table 5.3.13-x.*
The electrical interfaces for the Input/Output Discrete Type are shown in Appendix E *Table 5.3.13-x* and are used to generate the installation wiring diagrams. **Note:** When there are two discrete pin choices for the same pin function in Appendix E *Table 5.3.13-x*, use only the one that matches the aircraft wiring (use only the +28V and 0V or the Ground and Open definitions).

3.16 Category 14 – Audio Output Level

Category 14 controls the Audio Output level for alert menu callouts (cautions and warnings). Refer to Category 13 for information on the Mode 6 Low Volume discrete.

Appendix E Table 5.3.14 defines the Audio Output Level options and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

The Nominal Volume Select is equivalent to MK VI (classic) MAX volume level. The –6dB through –24 dB are successively lower volume from Nominal. The Nominal output is 4 watts rms into an 8-ohm load and 100 milli-watts rms into a 600-ohm load. The audio output level for Mode 6 alerts can be reduced an additional 6 dB by activating the Mode 6 Low Volume discrete of Category 13.

3.16.1 Instructions

Using Appendix E *Tables 5.2 and 5.3.14* as described above, select the Audio Output Level ID number that matches the feature preferences and version (part number) being installed.
Record the ID number for the Audio Output Level from Appendix E *Table 5.3.14* under the Ident No. heading for Step (Category) 14 in Appendix E *Table 5.2.*

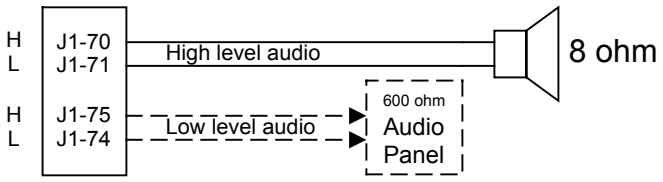


FIGURE 3.16-1 Audio Interface

3.17 Category 15 - 17 – Undefined Input Selects

Category 15-17 are undefined input selects at this time.

Appendix E Table 5.3.15, 5.3.16, and 5.3.17 define the Select options and identifies the first MK VI/VIII EGPWS version in which the option was available (see the Effectivity entry).

3.17.1 Undefined Input Select

Select ID 0 for all aircraft configurations. Input Select options will be added as new installations types are propagated.

3.17.2 Instructions

Using *Appendix E Table 5.2, 5.3.15, 5.3.16, and 5.3.17* as described above, select the Input Select type that matches the aircraft configuration, feature preferences and version (part number) being installed.
Record the ID number for the Input Select from Appendix E *Table 5.3.15, 5.3.16, and 5.3.17* under the Ident No. heading for Step (Category) 15, 16, & 17 in *Appendix E Table 5.2.*

SECTION IV

CONFIGURATION MODULE PROGRAMMING AND TERRAIN DATABASE LOADING

SECTION IV – CONFIGURATION MODULE PROGRAMMING AND REGIONAL TERRAIN DATABASE LOADING

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SECTION IV – Config Module Programming And Regional TDB Loading

4.1 Introduction

The following procedures outline the steps necessary to accomplish a complete configuration of the MK VI/MK VIII EGPWS. This section must be accomplished in the order presented to minimize errors in configuring and operating the system(s). If problems are encountered in performing these procedures, the installer may refer to aircraft wiring diagrams for harness troubleshooting or the aircraft maintenance manual to isolate faulty equipment. All discrepancies should be resolved before proceeding. This section will also load the Regional Terrain Database in MK VI EGPWS that will be operating outside the AMERICAS region.

4.2 Harness Checkout and Power Check

Prior to installing any equipment, it is important to verify that all interfaces have been made, and that power and ground at each unit connector is correct using the wiring diagrams for the installation. Any discrepancies in the wiring must be resolved before proceeding.

The wire harness should also be checked for proper clearance near any control cables and other potential areas that may cause binding and/or chafing.

4.3 Unit Installation

After the harness check has been completed and any discrepancies have been resolved, the units should be installed into their respective racks, and all connections to the wiring harness should be made (connectors attached). Verify that all of the units are secure in their respective racks, panels, etc., and all harness connections are secure. Refer to aircraft installation drawings for the unit locations and mounting information.

4.4 EGPWC Initialization and Configuration

The first time a MK VI/MK VIII EGPWS is turned on in a new installation, the Configuration Module in the EGPWS harness must be programmed to the specific interface configuration for the aircraft. This programming is done via RS-232 cable connection between the EGPWC and a PC running the Honeywell WinViews software. This interface capability is provided to facilitate diagnostic and configuration functions with the EGPWC during post installation checkout. Refer to Appendix C for instructions related to using the WinViews software.

4.4.1 RS-232 Communication with the MK VI/VIII EGPWS

The MK VI/MK VIII EGPWS computer contains software that allows monitoring of its internal parameters, for testing purposes, without altering its operation. The monitoring of these parameter values enables the operator to quickly determine if the EGPWC is using the correct signal and scaling. The communication link utilizes the RS-232 communication protocol configured as follows:

19200 Baud, No Parity, 8 Bits, and 1 Stop Bit

4.4.2 EGPWC Front Panel Test Connector

The RS-232 interface with the EGPWC is accomplished via a test connector provided on the EGPWC front panel (J3). This provides access for a PC test monitor and portable data loading capabilities. The mating connector for the EGPWC test plug (P3) is a male, 15 pin, double density D-subminiature type (or equivalent).

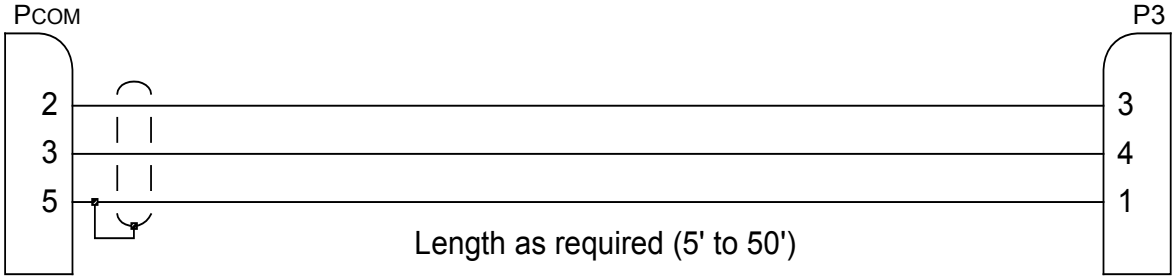
The connection between the PC serial port connector (with standard DB9) and the EGPWC RS-232 interface is defined as follows:

	RS-232 Receive	RS-232 Transmit	RS-232 Ground
EGPWS Front Connector (J3)	Pin 3	Pin 4	Pin 1
Standard (PC)* DB9 Connector	Pin 2	Pin 3	Pin 5

***NOTE:** Some PC Comm Ports have Pins 2 & 3 reversed from what is described above.

Connector, AMP 205161-1
Socket Contact, AMP 205090-1, QTY 3
M39029/63-368

Connector, AMP 204513-2*
Pin Contact, 204370-2, QTY 4*
M39029/58-360
Backshell, AMP 745854-5
Jackscrew, AMP 747784-3
Grommet Set, AMP 747746-1



* Alternate part number 748364-1 connector and 748333-4 or -7 pin contact.

4.4.3 WinVIEWS

(Windows Virtual Interface to the Enhanced Warning System)

WinVIEWS is a software tool developed by Honeywell to communicate with the EGPWS. WinVIEWS provides a detailed status of the software configuration and input signals, which enables quick identification of system configuration, and is utilized for programming the system Configuration Module.

To obtain a copy of the WinVIEWS software, contact:

Honeywell
Aerospace Electronic Systems
PO Box 97001
Redmond, WA 98073-9701 USA
Attn: Order Administration M/S 33
Phone: (425) 885-8719
FAX: (425) 885-8988

or

Honeywell
Aerospace Electronic Systems
PO Box 97001
Redmond, WA 98073-9701 USA
Attn: EGPWS Applications Engineering
Phone: (425) 885-3711
FAX: (425) 885-2994
GPWS Hotline: (800) 813-2099

WinVIEWS can be sent via e-mail when an e-mail address is provided.

4.4.4 WinVIEWS Operation

1. Connect the PC to the EGPWC using the RS-232 cable as described in section 4.4.2
2. On the PC, start Windows 3.1, or higher.
3. Start the WinVIEWS.EXE program.
4. Use **F6** to select the Terminal Mode. Various commands are available in this mode. Type “HELP” or “?” for a list of the commands available.

4.5 Configuration Module Programming

The EGPWC reads the aircraft configuration from the Configuration Module, which is installed in the EGPWC connector. The Configuration Module must have the aircraft specific configuration ID string written to it before the EGPWS is operational. The ID string is defined by 15 separate categories listed in Appendix E Table 5.2, Category ID Selection Procedure.

For programming the Configuration Module, the following procedure is used:

1. Verify EGPWC interface to P2 connector (including Configuration Module) and RS-232 interface to PC.
2. Power EGPWC and PC and start WinVIEWS.
3. With WinVIEWS active in the Terminal Mode, configuration sub-mode commands are available for programming purpose. Type “**CFG**” at the Terminal Mode prompt (>). At this point, the CFG> prompt is displayed and the program and EGPWC are ready for entering the program command and data string. Type “**HELP**” or “**?**” to display a list of the Terminal Mode commands and their description. “**CUW**” is the preface command for entering the ID string.

4. Using the Category ID's as chosen from the Appendix E (refer to completed Table 5.2), create a command string with the following structure:

   CFG> **CUW 0/15 # # # # # # # # # # # # # # #/**

- **CUW<space>0** is the command and version number. CUW writes the category ID's defined by version 0 definition (0 is the only version currently available) to the Configuration Module via the EGPWC without a CRC (checksum) value attached (this is generated by the EGPWC when the data is transmitted).

- **/15** indicates the beginning of the data string (/) with 15 being the number of categories to follow.

- **<space><Cat 1 ID#><space><Cat 2 ID #>…<Cat 15 ID#>/** each Cat ID# is the chosen ID for the category from the Appendix E Table 5.2. The ending slash (/) indicates the end of the data string.

  Note: If 15 ID's do not follow "/15", the error message "***Invalid Parameter. Not enough ID's. Configuration update failed, please try again***." will be given. The value entered for each category must be an available ID for the associated category or a similar error message will be given. If the number of categories provided is less than 15 (e.g., "/8 # … #/" with eight ID's defined), then the remaining categories (9 through 15) will be set to 0.

After completing the data string as defined above and pressing ENTER, the following message may appear: "***Confirm this data reflects configuration to be programmed (Y/N)***". If the message does not appear, the cursor will flash. In either case, it is waiting for an answer "Y" or "N". Pressing the Y (or y) key confirms the data and sends the data to the EGPWC to write to the Configuration Module.

Following the writing to the Configuration Module the EGPWC is automatically rebooted in order for the new configuration to take affect.

Note: If when the ENTER key is pressed the question response is not given (cursor just moves to the next line), pressing any character key should provide the proper response.

Pressing the N key results in the message "***Command aborted – No configuration module change has been made***". If necessary, revise the data to correct or change as necessary and continue as above. The backspace key can be used to make corrections.

5. Following the successful writing to the Configuration Module (no error messages) and EGPWC reboot, pressing **Control Z (Ctrl-Z)** restarts the WinVIEWS Terminal Mode communication.

6. There are a couple ways to now confirm the Configuration Module programming with the following being the preferred. As above, type "CFG" to restart the Configuration sub-mode. At the CFG> prompt, type "**CMR<Enter>**". Each category and its associated ID is read from the Configuration Module and listed on the PC screen. Alternately, when not in the Configuration sub-mode, the command "**PS<Enter>**" (Present Status) will display EGPWC and configuration data.

7. Configuration Module programming is complete. If the "CFG >" prompt is still present type "**Exit<Enter>**" to exit the Configuration sub-mode.

4.5.1 CUW and CMR Commands

An example CUW command/data string, its definition, and the corresponding CMR list is provided below.

CUW command/data string:

CFG > **CUW 0/15 2 3 2 0 0 3 93 1 0 0 0 0 0 0/**

Type “Y” or “y” to confirm the data and send the data to the EGPWC to write to the Configuration Module

Above configuration defined:

Category 1 Aircraft/Mode Type:	2	
Category 2 Air Data Type:	3	
Category 3 Position Type:	2	
Category 4 Altitude Callouts Menu:	0	
Category 5 Audio Menu:	0	(Basic menu)
Category 6 Display Type:	3	
Category 7 Options Select Group #1:	93	(Steep Approach True) (TA&D Alternate pop-up False) (Peaks Mode True) (Obstacle Awareness True) (Bank Angle True) (Flap Reversal False) (GPS Altitude Ref. MSL)
Category 8 Radio Altitude Type:	1	
Category 9 Navigation Type:	0	
Category 10 Attitude Type:	0	
Category 11 Heading Type:	0	
Category 12 Windshear select Type:	0	
Category 13 Discrete I/O Type:	0	
Category 14 Audio Output Level Type:	0	
Category 15 Undefined Type:	0	

CMR list: (based on the previous configuration)

CFG > **CMR<Enter>**

CONFIGURATION MODULE:

Format Version:	**0**
Category 1 ID:	**2**
Category 2 ID:	**3**
Category 3 ID:	**2**
Category 4 ID:	**0**
Category 5 ID:	**0**
Category 6 ID:	**3**
Category 7 ID:	**93**
Category 8 ID:	**1**
Category 9 ID:	**0**
Category 10 ID:	**0**
Category 11 ID:	**0**
Category 12 ID:	**0**
Category 13 ID:	**0**
Category 14 ID:	**0**
Category 15 ID:	**0**
CRC:	**527518533**

4.5.2 Configuration Module Reprogramming

Reprogramming the EGPWS Configuration Module is accomplished similar to the programming process above. Prior to reprogramming, the desired new configuration should be determined based on the MK VI/VIII Interface Description Document (Appendix E), document number 060-4314-401.

For reprogramming the Configuration Module, the following procedure is used:

1. Verify EGPWC interface to P2 connector (including Configuration Module) and RS-232 interface to PC.
2. Power EGPWC and PC and start WinVIEWS.
3. With WinVIEWS active in the Terminal Mode, start the Configuration sub-mode by typing "CFG" at the prompt (>). At this point, either all the ID's can be rewritten using the CUW command as before, or individual categories can be changed as follows:
4. At the *CFG* > prompt use the **CAT** command with the following structure:

- **CAT<space><category #><space><ID#><space><T or F><Enter>**
- <category #> is the Appendix E Category to change (example 7)
- <ID #> is the new ID to change to (example 92)
- <T or F> is True or False for rebooting the EGPWC. Use "T" if only one category is to be changed and the EGPWC will reboot following <Enter>. Use "F" if another individual ID is to be changed by another CAT operation.

Example: **CFG > CAT 7 92 T<Enter>**

5. After inputting the desired change information, pressing <Enter> will transmit the data to the EGPWC to write to the Configuration Module. If a reboot is commanded (T), then the EGPWC will reboot at the completion of the write process. If a reboot is not commanded (F), then a message "**Writing to configuration module … Category 7 ID updated successfully.**" is given and the **CFG >** prompt is again displayed. At this point the Configuration Module has been changed, but the change will not be effective until the EGPWC is rebooted. Additional changes can be made with the final change set to command the EGPWC to reboot (or cycle EGPWC power to reboot).
6. Verification of the changes made is the same as before. As above, type "**CFG**" to restart the Configuration sub-mode. At the **CFG >** prompt, type "**CMR<Enter>**". Each category and its associated ID is read from the Configuration Module and listed on the PC display. Alternately, when not in the Configuration sub-mode, the command "**PS<Enter>**" (Present Status) will display the EGPWC and Configuration Module data.
7. Configuration Module reprogramming is complete.

4.6 Terrain Database Loading

4.6.1 Effectivity

The MK VI EGPWS (965-1180-0XX and 965-1190-0XX) are shipped from the factory loaded with the Regional Terrain Database requested when the purchase order was placed. Use (operation) of a MK VI EGPWS outside of the loaded Regional Terrain Database will result in the Terrain Awareness function being unavailable. Aircraft operating outside the loaded Regional Terrain Database region will have to load one of the other two Regional Terrain Databases before beginning the ground test.

The MK VIII EGPWS (965-1210-0XX and 965-1220-0XX) have a Global Terrain Database.

4.6.2 Description

This modification consists of loading the PCMCIA card into the EGPWS either **In The Aircraft** or **On The Bench**. An optional verification procedure is provided.

4.6.3 Approval

This procedure contains no modification information that revises the approved configuration and therefore does not require FAA or other regulatory agency approval.

4.6.4 Material – Cost and Availability

The AMERICAS, ATLANTIC or PACIFIC region PCMCIA card is available at no charge to Operators. Order part from:

Honeywell
Airlines & Avionics Products
Order Administration M/S 33
PO Box 97001
Redmond, WA 98073-9701
Phone: 425-885-8719
Fax: 425-885-8988

Honeywell Aerospace
Toulouse Office
Centreda, Avenue Didier Daurat
31700 Blagnac, France
Phone: (33) 5-6171-0079
Fax: (33) 5-6130-0497

Vendor Name	Vendor P/N	Description	QTY	UM	Honeywell P/N
Honeywell	718-1391-xxx	AMERICAS Region Card	1	EA	718-1393-xxx
Honeywell	402-6075-xxx	AMERICAS Region Label	1	EA	402-6075-xxx
Honeywell	718-1392-xxx	ATLANTIC Region Card	1	EA	718-1392-xxx
Honeywell	402-6075-xxx	ATLANTIC Region Label	1	EA	402-6075-xxx
Honeywell	718-1393-xxx	PACIFIC Region Card	1	EA	718-1393-xxx
Honeywell	402-6075-xxx	PACIFIC Region Label	1	EA	402-6075-xxx

4.6.5 Accomplishment Instructions

Load the PCMCIA card data as described in paragraphs 4.6.5 A. or 4.6.5 B. below. Loading time will be approximately 10 minutes.

A. Loading the PCMCIA Card Data with Computer Mounted in the Aircraft.

(1) Connect the Smart Cable (Honeywell PN 951-0386-001) to the EGPWC J3 connector.

(2) Ensure that the 28 VDC circuit breaker to the EGPWC in ON and that the **COMPUTER OK** LED on the EGPWC front panel is on.

(3) Insert the PCMCIA card into the Smart Cable PCMCIA card slot.

NOTE: Precautionary notes on the PCMCIA card, regarding insertion and/or removal while power is applied, should be ignored since the EGPWC automatically handles the application and removal of PCMCIA card power.

(4) While the loading is in progress, the **IN PROG** LED on the Smart Card remains ON and the **COMPUTER OK** LED on the EGPWC is OFF.

(5) When loading is complete the **XFER COMP** LED on the Smart Card turns ON.

(6) Remove the PCMCIA card from the Smart Card slot.

(7) After approximately 15 seconds the **COMPUTER OK** LED comes ON to indicate that the contents of the PCMCIA card were successfully transferred.

(8) Remove the Smart Card connector from the EGPWC front panel J3 connector.

(9) To perform the verification of the Terrain Database version, go to paragraph 4.6.6 below.

B. Loading the PCMCIA Card Data with Computer Mounted on the Bench

(1) Locate a 28 VDC Power Supply with a minimum supply current of 2 amps.

(2) With the Power Supply turned OFF, connect the Power Supply to the J1 connector of the EGPWC as follows (pin J1-53 is connected to chassis ground internally and does not need to be ground in aircraft wiring):

J1 connector Pin	Pin Nomenclature
J1-40, J1-60	28 VDC (+)
J1-41, J1-61	28 VDC (-)
J1-42, J1-53	Chassis GND

Pins J1-42 and J1-53 are both connected to chassis ground internally. It is not necessary to tie them both to ground in the aircraft wiring. Pin J1-53 was made available to provide a convenient way to supply a ground to external equipment. If the OAT probe is not present, nothing needs to be tied to J1-53.

(3) Connect the Smart Cable (Honeywell PN 951-0386-001) to the EGPWC J3 connector.

(4) Turn the Power Supply ON and that the **COMPUTER OK** LED on the EGPWC front panel is on.

(5) Insert the PCMCIA card into the Smart Cable PCMCIA card slot.

NOTE: Precautionary notes on the PCMCIA card, regarding insertion and/or removal while power is applied, should be ignored since the EGPWC automatically handles the application and removal of PCMCIA card power.

(6) While the loading is in progress, the **IN PROG** LED on the Smart Card remains ON and the **COMPUTER OK** LED on the EGPWC is OFF.

(7) When loading is complete the **XFER COMP** LED on the Smart Card turns ON.

(8) Remove the PCMCIA card from the Smart Card slot.

(9) After approximately 15 seconds the **COMPUTER OK** LED comes ON to indicate that the contents of the PCMCIA card were successfully transferred.

(10) Remove the Smart Card connector from the EGPWC front panel J3 connector.

(11) To perform the verification of the Terrain Database version, go to paragraph 4.6.6 below.

4.6.6 Verification of the Terrain Database Version

Since the EGPWC software verifies the PCMCIA card loading process, this verification is to assure the operator/installer that the correct Regional Terrain Database version is installed.

Terrain Database version verification is accomplished with the EGPWS Self Test (ST) function. The ST function may be initiated from the aircraft cockpit with the GPWS Test Switch. **NOTE**: Initiation of the cockpit ST function may vary from one aircraft to another. For example, the ST function may be initiated by pressing the **GPWS (PULL-UP)** light assembly, or by activating a separate ST switch.

The EGPWS ST function has 6 levels that describe the current condition and configuration of the EGPWS, the fault and warning history, and the condition of the various inputs. To help navigate through the various levels, there are 2 cancel functions: **SHORT CANCEL** (press and hold the ST button for more than 0.5 seconds, but less than 2 seconds) and **LONG CANCEL** (press and hold the ST button for more than 2 seconds, but less than 8 seconds). The Short Cancel and Long Cancel functions operate differently, depending upon the ST level. To initiate a ST sequence, or to continue from level-to-level, the ST button must also be 'pressed and held' for more than 0.5 seconds, but less than 2 seconds, which is identical to the Short Cancel function.

Therefore, for simplicity, the phrase "Press ST Button" in the verification procedure means to press and hold the ST button for more than 0.5 seconds, but less than 2 seconds. The procedure guides the operator directly to ST Level 3, "System Configuration", skipping most of ST Level 1 and Level 2.

To verify the Regional Terrain Database that was just loaded into the EGPWC, perform these steps:

NOTE: 'On the Bench', this test requires an audio speaker and a self test button. These may not be available 'On the Bench' unless when using a Break-Out-Box.

(1) Ensure the EGPWC power is ON

(2) **Press ST button** to initiate ST Level 1.

(3) After ST Level 1 message starts, **Press ST button** to cancel Level 1 and start Level 2.

(4) After ST Level 2 message, "Current Faults", is heard, **Press ST button** to cancel Level 2.

(5) When the message, "Press to Continue", is heard, **Press ST button** to start ST Level 3.

(6) Verify the Terrain Database version annunciated in the following sequence:

a) "*SYSTEM CONFIGURATION*"

b) "*PART NUMBER 965-11X0-XXX*"

c) "*MOD STATUS XX*"

d) "*SERIAL NUMBER XXXX*"

e) "*APPLICATION SOFTWARE VERSION XXXXX*"

f) "*TERRAIN DATABASE VERSION XXXX*"

The following example of Terrain Database Version annunciation: "419A" (for ATLANTIC), "419P" (for PACIFIC), or "419N" (for AMERICAS). Other versions will follow the same pattern (e.g. "421P").

(7) Other messages that follow the Terrain Database Version can be ignored. When ST Level 3 finishes, the message "Press to Continue" is heard. If the ST button is not pressed again the ST sequence terminates.

NOTE: If power was connected to the EGPWC per steps B1 through B4, perform shut-down per steps (7) and (8) following.

(8) **Turn Power Supply OFF.**

(9) Disconnect Power leads from the EGPWC.

END OF TEST

SECTION V

CERTIFICATION

SECTION V – CERTIFICATION

5.1 Introduction

This section outlines the procedures required to obtain FAA approval for the MK VI/MK VIII EGPWS installation. Recommended flight test procedures are also included.

5.2 Certification Procedure

5.2.1 Equipment Compatibility

Careful consideration must be paid to the electrical characteristics of existing equipment or possible additions that will be interfaced to the MK VI/MK VIII EGPWS, in order to ensure system compatibility. Section III of this manual provides system planning guidelines, and defines the electrical characteristics of the EGPWS. The installing agency should contact Honeywell Product Support (800-813-2099), for information regarding the compatibility of equipment not listed in Section III. Normal business hours are 8:00 AM to 5:00 PM Pacific Time, Monday through Friday.

5.2.2 Equipment Location

The EGPWS and associated indicators, annunciators, and switches should be clearly visible and within easy reach of the pilot(s). Refer to Section II of this manual for complete installation information.

5.2.3 FAA Requirements

The installing agency should contact a local FAA Inspector who will determine whether the installation may be approved by Supplemental Type Certificate (STC) or by submitting FAA Form 337 with an applicable STC package.

5.2.4 Ground Test

Honeywell has developed a generic Installation Ground Test Procedure for the MK VI/MK VIII EGPWS, drawing number 060-4167-158.

5.2.5 Flight Manual Revision

Honeywell has developed a generic Airplane Flight Manual Supplement for the MK VI/MK VIII EGPWS, drawing number 060-4199-194.

5.2.6 Flight Test

Honeywell has developed a generic Flight Test procedure for the MK VI/MK VIII EGPWS (GA-Fast and GA-Slow aircraft), drawing number 060-4188-041. A separate generic Flight Test procedure has been developed for MK VIII EGPWS Bizjet aircraft, drawing number 060-4188-023. The Flight Test procedures were developed for

first of type installations, for these installations all sections of the Flight Test procedure shall be performed. Precedence has been established for testing only the Terrain Awareness functions when replacing an existing MK VI GPWS. Installers should contact their local FAA office for confirmation of this approach.

For follow on installations of the same aircraft type and interface, the flight test is not required. When updating an STC to the current part number it is only necessary to flight test significant new features. The notice of change is available in Honeywell Service Bulletins.

Suggestions for recording of the EGPWS data during a Flight Test for follow on analysis:

- In WinViews change the recording Sample Rate to 1 second intervals (WinViews / Terminal Mode / Options / Settings / 1000). This sample rate will record adequate data for future analysis.
- Continue recording between tests. Missing data is aggravating. Recording in flight between test sites (hundreds of miles apart) is not necessary but continuous recording when Mode 1 ends and Mode 4 begins is helpful. Recording of the take off from brakes locked through climb out also aids later analysis, as does continuous recording of approach to aircraft off the runway.
- The WinViews software program records in 1.44 megabyte files that can be transferred from Laptop computer to other computers with ease. Using 1 second sample rate the EGPWS will record approximately 40K bytes per minute of data. 1 hour of recorded time would be approximately 2.4MB, most laptops have 1GB or more free space.
- Use the Event Marker, F9 key, to identify events during tests.
- Use the F10 key to roll (increment) the history file name between test sequences. Rolling adds a number to the end of the filename (or increments the existing number, if possible.) Example: use tail number (N3GC) in the file name with a file number (01), this gives a filename N3GC01.hst which will roll to N3GC02.hst when the F10 key is pressed.

5.2.7 Pilots Guide

Honeywell has developed a Pilot's Guide for the MK VI/MK VIII EGPWS, drawing number 060-4314-000 that provides a description of the modes and the controls of the EGPWS.

5.2.8 Failure Modes, Effects, and Safety Analysis

Honeywell has developed a Failure Modes, Effects, and Safety Analysis document for the MK VI/MK VIII EGPWS, drawing number 060-4199-182 that provides an analysis of the failure modes of the EGPWS.

SECTION VI

MK VI GPWS (classic) to EGPWS MK VI/VIII

Pin to Pin Comparison

SECTION VI - MK VI GPWS to MK VI/VIII EGPWS Signal Mapping

Connector Pin-Out Sorted By Pin Number (USE FOR REFERENCE ONLY)

shaded area indicates function change **X**=Indicates same function

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
Roll Attitude Synchro (X)	**Synchro**	**X**	**J1-01**	**< AC Analog3W1**	Roll Attitude Synchro (X)
Chassis Ground	**GND**		**J1-02**	**< AC Analog3W3**	Roll Attitude Synchro (Z)
Spare #1 Program Pin	**ProgPin**		**J1-03**	**< AC Analog3W1**	Magnetic Heading Synchro (Z)
Alternate Airspeed Expansion Program Pin	**ProgPin**		**J1-04**	**< AC Analog (H)**	26 VAC Reference #1 (H)
Fixed Landing Gear Program Pin	**ProgPin**		**J1-05**	**< AC Analog3W1**	Pitch Synchro (X)
Audio Volume Control #2 Program Pin	**ProgPin**		**J1-06**	**< AC Analog3W3**	Pitch Synchro (Z)
200' Altitude Callout Program Pin	**ProgPin**		**J1-07**	**< AC Analog3W2**	Pitch Synchro (Y)
Radio Altimeter ALT 55 Scale Program Pin	**ProgPin**		**J1-08**	**<** 28vDisc	Autopilot Engaged Discrete (+28VDC)
Barometric Altitude Rate Validity (+28VDC)	**Discrete**	**X**	**J1-09**	**<** 28vDisc	Barometric Altitude Validity (+28VDC)
Glideslope Deviation Low Level Validity (L)	**DC-AnalogL**	**X**	**J1-10**	**< Analog (-)**	Glideslope Deviation Low Level Validity (-) and Localizer Deviation Low Level (-Left)
Glideslope Deviation Validity (+28VDC)	**Discrete**	**X**	**J1-11**	**<** 28vDisc	Glideslope Deviation Validity (+28VDC)
Spare	**Reserved**	**X**	**J1-12**	**< GDisc**	Terrain Awareness & TCF Inhibit Discrete (GND)
Altitude Callouts Volume Reduction Discrete (GND)	**Discrete**	**X**	**J1-13**	**< GDisc**	Mode 6 Low Volume Discrete (GND)
GPWS Flap Override Discrete (GND)	**Discrete**	**X**	**J1-14**	**< GDisc**	Flap Override Discrete (GND) **(from FLAP OVRD SW)**
Glideslope Manual Cancel Discrete (GND)	**Discrete**	**X**	**J1-15**	**< GDisc**	**Glideslope Cancel Discrete (Gnd) (from GS Cancel SW)**
Landing Gear Discrete (GND)	**Discrete**	**X**	**J1-16**	**< GDisc**	**Landing Gear Discrete (GND)**
External GPWC Audio Suppression Discrete (GND)	**Discrete**	**X**	**J1-17**	**< GDisc**	**Audio Inhibit Discrete (GND)**
Landing Flap Discrete (GND)	**Discrete**	**X**	**J1-18**	**< GDisc**	**Landing Flaps Discrete (GND)**
ILS Backcourse Approach Selected Discrete (GND)	**Discrete**	**X**	**J1-19**	**< GDisc**	**Glideslope Inhibit Discrete (GND)**
ILS Frequency Selected Discrete (GND)	**Discrete**	**X**	**J1-20**	**< GDisc**	**ILS Tuned Discrete (GND)**
Roll Attitude Synchro (Y)	**Synchro**	**X**	**J1-21**	**< AC Analog3W2**	Roll Attitude Synchro (Y)
Spare	**Reserved**		**J1-22**	**< AC Analog3W1**	Magnetic Heading Synchro (X)
Spare	**Reserved**		**J1-23**	**< AC Analog3W2**	Magnetic Heading Synchro (Y)
Landing Flap Logic Inversion Program Pin	Progpin		J1-24	**< AC Analog (L)**	26 VAC Reference #1 (L)
Alternate Mode 4B Threshold Program Pin	Progpin		J1-25	5Vref+ **>**	Air Temperature Reference (+5VDC)

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
Audio Volume Control #1 Program Pin	Progpin		J1-26	**< Analog (+)**	Spare
500' Altitude Callout Program Pin	Progpin		J1-27	**< Analog (-)**	Spare
Spare Discrete (+28VDC)	**Discrete**		**J1-28**	**<** 28vDisc	Magnetic Heading Validity Discrete (+28VDC)
Radio Altimeter Validity (+28VDC)	**28vDisc**	**X**	**J1-29**	**< 28vDisc**	**Radio Altitude Validity Discrete (+28VDC)**
Glideslope Deviation Low Level Validity (H)	**DC-AnalogL**	**X**	**J1-30**	**< Analog (+)**	Glideslope Deviation Low Level Validity (+) and Localizer Deviation Low Level (+Right)
Spare #1 Discrete	**Discrete**		**J1-31**	**< GDisc**	Display Selected Discrete #2 (GND)
Airspeed Expansion Discrete	**Discrete**		**J1-32**	**< GDisc**	Display Selected Discrete #1 (GND)
Decision Height DH Discrete (GND)	**Discrete**	**X**	**J1-33**	**< Gdisc**	**DH Discrete (GND)**
GPWS Self Test Discrete (GND)	**Discrete**	**X**	**J1-34**	**< GDisc**	**Self Test Discrete (GND) (from GPWS push to test Sw)**
Landing Gear Discrete (+28VDC)	**Discrete**	**X**	**J1-35**	**< 28vdisc**	**Landing Gear Discrete (+28VDC)**
External GPWS Audio Suppress Discrete (+28VDC)	**Discrete**	**X**	**J1-36**	**< 28vdisc**	**Audio Inhibit Discrete (+28VDC)**
Landing Flap Discrete (+28VDC)	**Discrete**	**X**	**J1-37**	**< 28vdisc**	**Landing Flaps Discrete (+28VDC)**
ILS Backcourse Approach Selectd Discrete (+28V)	**Discrete**	**X**	**J1-38**	**< 28vdisc**	**Glideslope Inhibit Discrete (+28VDC)**
ILS Frequency Selected Discrete (+28VDC)	**Discrete**	**X**	**J1-39**	**< 28vdisc**	**ILS 1 Tuned Discrete (+28VDC)**
Power Input (+28VDC)	**PWR/GND**	**X**	**J1-40**	**< PWRH**	**Power Input 28VDC (+)**
Power Input (GND)	**PWR/GND**	**X**	**J1-41**	**< PWRL**	**Power Input 28VDC (return)**
Chassis Ground	**GND**	**X**	**J1-42**	**< GND__C**	**Chassis Ground**
Barometric Altitude Rate Input (-)	**DC-AnalogL**		**J1-43**	**< Analog (-)**	**Barometric Altitude (-)**
Airspeed Input (-)	**DC-AnalogL**		**J1-44**	**< Analog (-)**	**Air Temperature (-)**
Radio Altimeter Input (-)	**DC-AnalogL**	**X**	**J1-45**	**< Analog (-)**	**Radio Altitude: ARINC 552 or ALT-55 (-) RT-200/300 Precision (+)**
Glideslope Deviation Input (+ down)	**DC Analog**	**X**	**J1-46**	**< Analog (-)**	**Glideslope Deviation Low Level (+down)**
Test Point #1	**Test point**		**J1-47**	**< Analog (-)**	**Spare**
Test Point #2	**Test point**		**J1-48**	**< 28vdisc**	**Localizer Validity Discrete (+28VDC)**
Test Point #3	**Test point**		J1-49	Lampout **> (gnd)**	Terrain Select Relay Output #2 (to TERR lamp and/or Relay)
Test Point #4	**Test point**		J1-50	**Monitor Out > (gnd)**	Windshear Inop Lamp Output (monitor)
Test Point #5	**Test point**		J1-51	Lampout **> (gnd)**	Terrain Pop Up Discrete Output
Test Point #6	**Test point**		J1-52	Lampout **> (gnd)**	Steep Approach Windshear Caution
Test Point #7	**Test point**		**J1-53**	**< GND**	**Temperature Probe (GND)**
Test Point #8	**Test point**		J1-54	Lampout **> (gnd)**	Terrain Select Relay Output #1 (to TERR lamp and/or Relay)

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
Test Point #9	**Test point**		J1-55	**Monitor Out > (gnd)**	TAD / TCF INOP Output (monitor)
Test Point #10	**Test point**		J1-56	453 Out (A) **>**	Terrain Display Output Data #2 (A leg)
Test Point #11	**Test point**		J1-57	453 Out (B) **>**	Terrain Display Output Data #2 (B leg)
Test Point #12	**Test point**		J1-58	453 Out (A) **>**	Terrain Display Output Data #1 (A leg)
Test Point #13	**Test point**		J1-59	453 Out (B) **>**	Terrain Display Output Data #1 (B leg)
Power Input (+28VDC)	**PWR/GND**	**X**	**J1-60**	**< PWRH**	**Power Input 28VDC (+)**
Power Input (GND)	**PWR/GND**	**X**	**J1-61**	**< PWRL**	**Power Input 28VDC (return)**
Barometric Altitude Rate Input (+)	**DC-AnalogL**		**J1-62**	**< Analog (+)**	**Barometric Altitude (+)**
Airspeed Input (-)	**DC-AnalogL**		**J1-63**	**< Analog (+)**	**Air Temperature (+)**
Radio Altimeter Input (+)	**DC-AnalogL**	**X**	**J1-64**	**< Analog (+)**	**Radio Altitude: ARINC 552 or ALT-55 (+)** **RT-200/300 Precision (-)**
Glideslope Deviation Input (+ Up)	**DC Analog**	**X**	**J1-65**	**< Analog (+)**	**Glideslope Deviation Low Level (+up)**
Spare	**Reserved**		**J1-66**	**< Analog (+)**	**Spare**
Spare	**Reserved**		**J1-67**	**< GDisc**	**GPWS Inhibit**
Spare Lamp Output	**Output**		**J1-68**	**< 28vdisc**	**Attitude Validity Discrete (+28VDC)**
TCAS II Inhibit Output	**Output**	**X**	**J1-69**	Lampout **> (gnd)**	Audio ON Output
Audio Speaker Output – 8-ohm (H)	**Output**	**X**	**J1-70**	**HL Audio Out (H) >**	**High Level Audio Output - 8Ω (+)**
Audio Speaker Output – 8-ohm (L)	**Output**	**X**	**J1-71**	**HL Audio Out (L) >**	**High Level Audio Output - 8Ω (-)**
GPWS System Status Lamp	**Output**	**X**	**J1-72**	**Monitor Out > (gnd)**	**GPWS INOP (monitor) (to GPWS Fail/Inop lamp)**
GPWS Flap OVRD	**Output**	**X**	**J1-73**	**Lampout > (gnd)**	**Flap Override Output (to FLAP OVRD lamp)** **Windshear Warning**
Audio Low Level (C)	**Output**	**X**	**J1-74**	**LLAud Out (L) >**	**Low Level Audio 600-ohm (C)**
Audio Low Level (H)	**Output**	**X**	**J1-75**	**LLAud Out (H) >**	**Low Level Audio 600-ohm (H)**
Glideslope Cancelled Lamp	**Output**	**X**	**J1-76**	**Lampout > (gnd)**	**Glideslope Cancel Output (to GS CANCL'D lamp)**
Glideslope Alert Lamp	**Output**	**X**	**J1-77**	**Lampout > (gnd)**	**Lamp Format 1: Glideslope Alert Output** **Lamp Format 2: GPWS, Terrain or Obstacle Caution**
GPWS Alert/Warning Lamp	**Output**	**X**	**J1-78**	**Lampout > (gnd)**	**GPWS Warning Output (to red GPWS or Pull Lamp)** **Terrain Caution or Warning** **Obstacle Caution or Warning**

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
NEW CONNECTOR					
			J2-01	< AC Analog3W1	Configurable Synchro #1 (X leg)
			J2-02	< AC Analog3W2	Configurable Synchro #1 (Y leg)
			J2-03	< AC Analog3W3	Configurable Synchro #2 (Z leg)
			J2-04	< 429 IN (B)	Radio Altitude ARINC 429 Input (B leg) IOC #2 (Nav) ARINC 429 Input (B leg)
			J2-05	< 429 IN (B)	ILS ARINC 429 Input (B leg)
			J2-06	< 429 IN (B)	AHRS ARINC 429 Input (B leg) GPS #2 ARINC 429 Input (B leg)
			J2-07	< 429 IN (B)	Spare ARINC 429 Input (B leg)
			J2-08	< 429 IN (B)	GPS ARINC 429 Input (B leg)
			J2-09	429 OUT (B) >	EGPWS ARINC 429 Output #2 (B leg)
			J2-10	< 232 IN (B)	Spare RS-422 Input (B leg) SCI Display Range #2 RS-422 Input (A leg)
			J2-11	< 232 IN (A)	Spare RS-232 Input (Rcv) Spare RS-422 Input (A leg) SCI Display Range #2 RS-422 Input (B leg)
			J2-12	< 232 IN (B)	GPS RS-422 Input (B leg)
			J2-13		
			J2-14	< GND	Spare RS-232 Common
			J2-15	< 28vDisc	Spare Discrete (+28VDC)
			J2-16	< PWR (L)	Configuration Module Power (GND)
			J2-17	< PWR (H)	Configuration Module Power (+5VDC)
			J2-18	< AC Analog3W3	Configurable Synchro #1 (Z leg)
			J2-19	< AC Analog3W1	Configurable Synchro #2 (X leg)
			J2-20	< AC Analog3W2	Configurable Synchro #2 (Y leg)
			J2-21	< 429 IN (A)	Radio Altitude ARINC 429 Input (A leg) IOC #2 (Nav) ARINC 429 Input (A leg)
			J2-22	< 429 IN (A)	ILS ARINC 429 Input (A leg)
			J2-23	< 429 IN (A)	AHRS ARINC 429 Input (A leg) GPS #2 ARINC 429 Input (A leg)
			J2-24	< 429 IN (A)	Spare ARINC 429 Input (A leg)
			J2-25	< 429 IN (A)	GPS ARINC 429 Input (A leg)
			J2-26	429 OUT (A) >	EGPWS ARINC 429 Output #2 (A leg)

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
			J2-27	< 232 IN (A)	Spare RS-232 Input (Tx) Spare RS-422 Input (A leg)
			J2-28	< GND	GPS/Spare RS-232 Common
			J2-29	< 232 IN (A)	GPS RS-232 Input (Rcv) Spare RS-422 Input (A leg)
			J2-30		
			J2-31	< GDisc	Steep Approach #2 (GND)
			J2-32	Clock >	Configuration Module Serial Clock
			J2-33	Data >	Configuration Module Serial Input
			J2-34	< AC Analog (H)	26 VAC Reference #2 (H)
			J2-35	< AC Analog (L)	26 VAC Reference #2 (L)
			J2-36	< 429 input (B)	Display Range #1 ARINC 429 Input (B leg) SCI Display Range #1 RS-422 Input (A leg) IOC #1 ARINC 429 Input (B leg)
			J2-37	< 429 input (A)	Display Range #1 ARINC 429 Input (A leg) SCI Display Range #1 RS-422 Input (B leg) IOC #1 ARINC 429 Input (A leg)
			J2-38	< 429 input (B)	Air Data ARINC 429 Input (B leg) IOC #1 (Nav) ARINC 429 Input (B leg)
			J2-39	< 429 input (A)	Air Data ARINC 429 Input (A leg) IOC #1 (Nav) ARINC 429 Input (A leg)
			J2-40	< 429 input (B)	Display Range #2 ARINC 429 Input (B leg) IOC #2 ARINC 429 Input (B leg)
			J2-41	< 429 input (A)	Display Range #2 ARINC 429 Input (A leg) IOC #2 ARINC 429 Input (A leg)
			J2-42	429 Output (B) >	EGPWS ARINC 429 Output #1 (B leg)
			J2-43	429 Output (A) >	EGPWS ARINC 429 Output #1 (A leg)
			J2-44	< 232 input (B)	Spare RS-422 Input (B leg)
			J2-45	< 232 input (A)	GPS RS-232 Input (Tx) Spare RS-422 Input (A leg)
			J2-46	< 232 input (B)	Spare RS-422 Input (B leg)
			J2-47		
			J2-48		
			J2-49	< GDisc	Configuration Module Serial Select
			J2-50	< Data	Configuration Module Serial Output

Signal Name –MK-VI GPWS (965-0686-001, -020)	*Signal Type*	*Same*	*Conn/Pin*	*Signal Type* < IN Out >	*Signal Name -MK-VI/MK VIII EGPWS (Enhanced)*
NEW CONNECTOR					
			J3-01	PWR (L) >	SmartCable Power Return (GND)
			J3-02	< Gdisc	PCMCIA Card Present
			J3-03	< Data	EGPWS Monitor Port RS-232 (RCV)
			J3-04	Data >	EGPWS Monitor Port RS-232 (XMT)
			J3-05		
			J3-06	PWR (H) >	SmartCable Power (+5VDC)
			J3-07	< Clock	SmartCable Serial Clock
			J3-08	< Data	SmartCable Serial Input
			J3-09	Data >	SmartCable Serial Output
			J3-10	< Gdisc	SmartCable Serial Select
			J3-11	< Gdisc	GSE present
			J3-12	< GND	Ground
			J3-13	< GND	Ground
			J3-14	< GND	Ground
			J3-15		
			GPS ANT	< RF	GPS COAX Connection

APPENDIX A - Customer Worksheet

MK VI / MK VIII EGPWS

ENHANCED GROUND PROXIMITY WARNING SYSTEM

Honeywell

CUSTOMER INTERFACE WORK SHEET

DATE: _____

The purpose for this work sheet is to obtain the necessary aircraft data for determining the specific interface configuration for the MK VI or MK VIII Enhanced Ground Proximity Warning System (EGPWS). For defined MK VI and MK VIII EGPWS interface data, refer to Appendix E, *Interface Description Document (IDD)* for the Mark VI and VIII Enhanced Ground Proximity Warning System (MKVI/VIII EGPWS). For product description information, refer to Honeywell document No. 965-1176-601, *Product Specification for the Mark VI and VIII Enhanced Ground Proximity Warning System*. Contact Honeywell EGPWS Applications Engineering for assistance (800-813-2099 or 425-885-8719).

Aircraft Operator: Contact: Phone:	Installer: Contact: Phone:
Aircraft Type (be specific):	Engine Type (model number):

CURRENT GPWS INSTALLATION:

If GPWS is currently installed in the aircraft, please provide the following information:

Manufacturer:	Model No.	Part No.

COCKPIT DISPLAYS:

Please provide the following information for intended EGPWS display purposes (include any new displays planned):

SYSTEM	QTY	MANUFACTURER	MODEL NO.	PART NO.	SOFTWARE NO.
EFIS Symbol Generator					
EFIS Display					
EFIS Display Control Panel					
Multifunction Display (MFD)					
Weather Radar Indicator					
Weather Radar R/T					
Weather Radar Controller					
Other (specify)					

AIRCRAFT SYSTEMS INFORMATION: (Use "N/A" if Not Applicable)

Please provide the manufacturer, model number, part number, software part number, quantity per aircraft, and output data information for:

SYSTEM	MFGR.	MODEL NO.	PART NO.	S/W PART NO.	QTY	OUTPUT DATA FORMAT – NOTES (ARINC 429, 547, 552, 575, DC, synchro, potentiometer, discrete, etc. Identify available ARINC 429 labels)
Air Data Computers						
Radio Altimeters						
ILS Receivers						
AHRS / IRU / INU						
VG						
DG						
GPS *						* GPS Altitude Reference: WGS-84 ☐ MSL ☐

DISCRETE INPUTS:

Please check applicable boxes for both up and down positions.

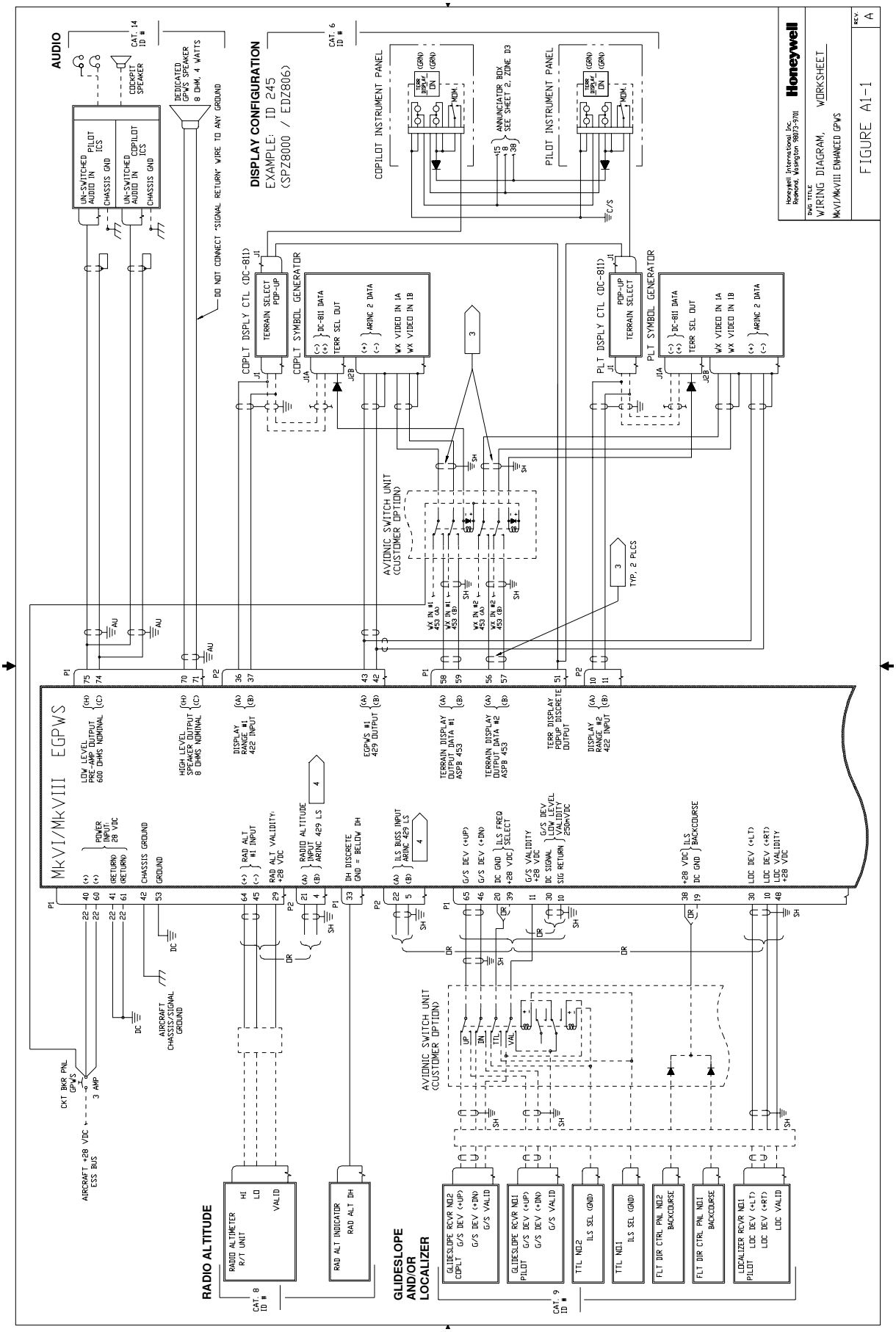
PARAMETER	GND	OPEN	+28 VDC
Flaps Down (landing configuration)	☐ >____°	☐	☐ >____°
Flaps Up	☐ <____°	☐	☐ <____°
Landing Gear Down	☐	☐	☐
Landing Gear Up	☐	☐	☐

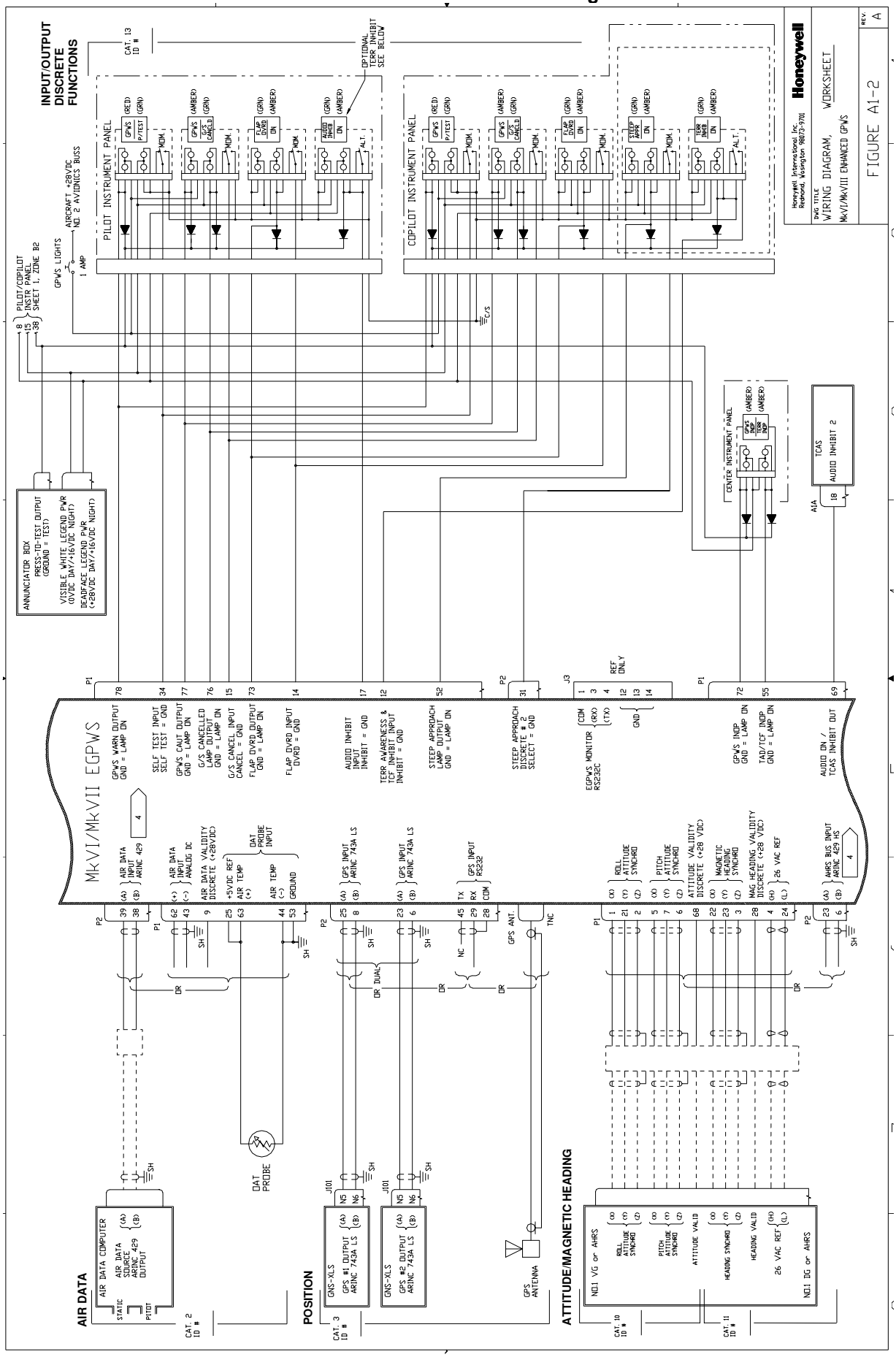
Notes: _____

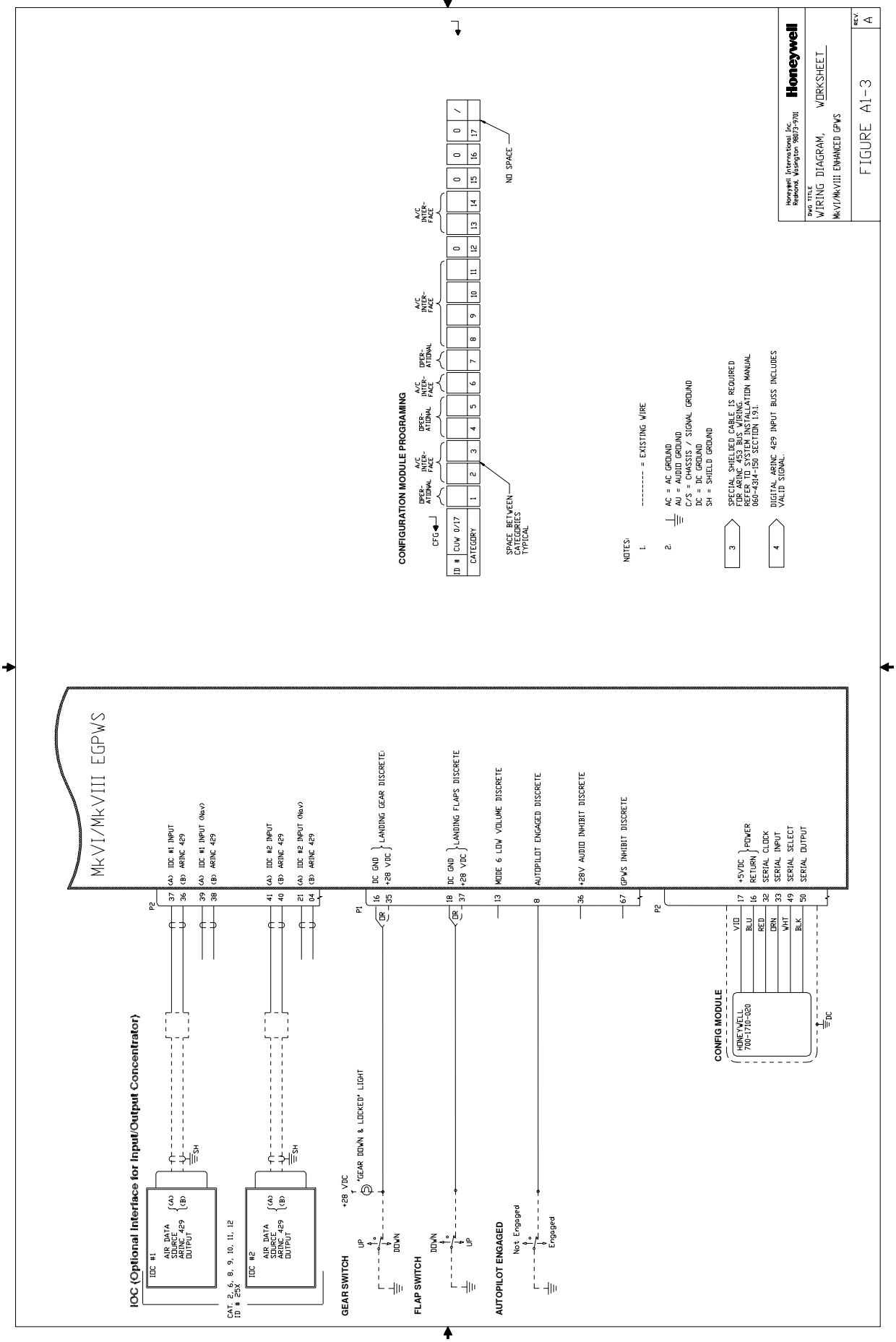
_____

_____

APPENDIX B - Sample Wiring Diagrams


AUDIO
DISPLAY CONFIGURATION
EXAMPLE: ID 245
(SPZ8000 / EDZ806)
COPILOT INSTRUMENT PANEL
PILOT INSTRUMENT PANEL
ANNUNCIATOR BOX
SEE SHEET 2, ZONE D3
COPLT DSPLY CTL (DC-811)
COPLT SYMBOL GENERATOR
PLT DSPLY CTL (DC-811)
PLT SYMBOL GENERATOR
AVIONIC SWITCH UNIT
(CUSTOMER OPTION)
DO NOT CONNECT "SIGNAL RETURN" WIRE TO ANY GROUND
MkVI/MkVIII EGPWS
RADIO ALTITUDE
GLIDESLOPE AND/OR LOCALIZER
Honeywell International Inc.
Redmond, Washington 98073-9701
Honeywell
DWG TITLE
WIRING DIAGRAM, WORKSHEET
MkVI/MkVIII ENHANCED GPWS
FIGURE A1-1
REV. A


INPUT/OUTPUT DISCRETE FUNCTIONS
PILOT INSTRUMENT PANEL
COPILOT INSTRUMENT PANEL
CENTER INSTRUMENT PANEL
OPTIONAL TERR INHIBIT SEE BELOW
AIRCRAFT +28VDC NO. 2 AVIONICS BUSS
GPWS LIGHTS
1 AMP
PILOT/COPILOT INSTR PANEL SHEET 1, ZONE B2
ANNUNCIATOR BOX
PRESS-TO-TEST OUTPUT (GROUND = TEST)
VISIBLE WHITE LEGEND PWR (0VDC DAY/+16VDC NIGHT)
DEADFACE LEGEND PWR (+28VDC DAY/+16VDC NIGHT)
MK-VI/MK-VIII EGPWS
GPWS WARN OUTPUT GND = LAMP ON
SELF TEST INPUT SELF TEST = GND
GPWS CAUT OUTPUT GND = LAMP ON
G/S CANCELLED LAMP OUTPUT GND = LAMP ON
G/S CANCEL INPUT CANCEL = GND
FLAP DVRD OUTPUT GND = LAMP ON
FLAP DVRD INPUT DVRD = GND
AUDIO INHIBIT INPUT INHIBIT = GND
TERR AVAWRENESS & TCF INHIBIT INPUT INHIBIT = GND
STEEP APPROACH LAMP OUTPUT GND = LAMP ON
STEEP APPROACH DISCRETE # 2 SELECT = GND
EGPWS MONITOR RS232C
GPWS INDP GND = LAMP ON
TAD/TCF INDP GND = LAMP ON
AUDIO ON / TCAS INHIBIT OUT
AIR DATA INPUT ARINC 429
AIR DATA INPUT ANALOG DC
AIR DATA VALIDITY DISCRETE (+28VDC)
+5VDC REF
AIR TEMP (+)
AIR TEMP (-)
GROUND
DAT PROBE INPUT
GPS INPUT ARINC 743A LS
GPS INPUT RS232
ROLL ATTITUDE SYNCHRO
PITCH ATTITUDE SYNCHRO
ATTITUDE VALIDITY DISCRETE (+28 VDC)
MAGNETIC HEADING SYNCHRO
MAG HEADING VALIDITY DISCRETE (+28 VDC)
26 VAC REF
AHRS BUS INPUT ARINC 429 HS
AIR DATA
AIR DATA COMPUTER
STATIC
PITOT
AIR DATA SOURCE ARINC 429 OUTPUT
POSITION
GNS-XLS
GPS #1 OUTPUT ARINC 743A LS
GPS #2 OUTPUT ARINC 743A LS
GPS ANTENNA
ATTITUDE/MAGNETIC HEADING
NO.1 VG or AHRS
NO.1 DG or AHRS
ROLL ATTITUDE SYNCHRO
PITCH ATTITUDE SYNCHRO
ATTITUDE VALID
HEADING SYNCHRO
HEADING VALID
26 VAC REF
TCAS
AUDIO INHIBIT 2
A1A
CAT. 2 ID #
CAT. 3 ID #
CAT. 10 ID #
CAT. 11 ID #
CAT. 13 ID #
Honeywell International Inc. Redmond, Washington 98073-9701
Honeywell
DWG TITLE
WIRING DIAGRAM, WORKSHEET
MK-VI/MK-VIII ENHANCED GPWS
FIGURE A1-2
REV. A


MK VI/MK VIII EGPWS
IOC (Optional Interface for Input/Output Concentrator)
IDC #1
AIR DATA SOURCE ARINC 429 OUTPUT
IDC #2
CAT. 2, 6, 8, 9, 10, 11, 12 ID # 25X
GEAR SWITCH
+28 VDC
"GEAR DOWN & LOCKED" LIGHT
UP
DOWN
FLAP SWITCH
AUTOPILOT ENGAGED
Not Engaged
Engaged
IDC #1 INPUT
ARINC 429
IDC #1 INPUT (Nav)
IDC #2 INPUT
IDC #2 INPUT (Nav)
DC GND
+28 VDC
LANDING GEAR DISCRETE
LANDING FLAPS DISCRETE
MODE 6 LOW VOLUME DISCRETE
AUTOPILOT ENGAGED DISCRETE
+28V AUDIO INHIBIT DISCRETE
GPWS INHIBIT DISCRETE
+5VDC
RETURN
POWER
SERIAL CLOCK
SERIAL INPUT
SERIAL SELECT
SERIAL OUTPUT
CONFIG MODULE
HONEYWELL 700-17749-020
VIO
BLU
RED
ORN
WHT
BLK
DC
CONFIGURATION MODULE PROGRAMING
CFG
ID # CUW 0/17
CATEGORY
DISCRETE
A/C INTERFACE
OPERATIONAL
SPACE BETWEEN CATEGORIES TYPICAL
NO SPACE
NOTES:
1. -------- = EXISTING WIRE
2. AC = AC GROUND
AU = AUDIO GROUND
C/S = CHASSIS / SIGNAL GROUND
DC = DC GROUND
SH = SHIELD GROUND
3 SPECIAL SHIELDED CABLE IS REQUIRED FOR ARINC 453 BUS WIRING. REFER TO SYSTEM INSTALLATION MANUAL 060-4314-150 SECTION 19.1.
4 DIGITAL ARINC 429 INPUT BUSS INCLUDES VALID SIGNAL.
Honeywell International Inc. Redmond, Washington 98073-9701
Honeywell
DWG TITLE
WIRING DIAGRAM, WORKSHEET
MkVI/MkVIII ENHANCED GPWS
FIGURE A1-3
REV A

APPENDIX C

WinVIEWS OPERATION INSTRUCTIONS

APPENDIX C – WinVIEWS Operation Instructions

RS-232 COMMUNICATION WITH THE EGPWS

The EGPWS contains software that allows monitoring of its internal parameters, for testing purposes, without altering its operation. The monitoring of these parameter values enables the operator to quickly determine if the correct signal and scaling is being used by the EGPWS computer. The communication link utilizes the RS-232 Communication Protocol configured as follows:

19200 Baud, No Parity, 8 bits, and 1 stop bit.

The RS-232 interface with the EGPWS is accomplished via the J3 test connector on the front of the EGPWS. The connection between a PC (with a standard DB9 serial port connector) and the EGPWS RS-232 interface is defined as follows: (Please note that the EGPWS will activate its RS-232 port only when it receives the command **CONTROL Z** after power is applied to the EGPWS. The CONTROL Z command is automatically sent by WinVIEWS)

	RS-232 Receive	RS-232 Transmit	RS-232 Ground
EGPWS Front Connector	Pin 3	Pin 4	Pin 1
Standard DB9 Connector (for a PC)*	Pin 2	Pin 3	Pin 5

***NOTE:** Some PC Comm Ports have Pins 2 & 3 reversed from what is described above.

The mating connector for the EGPWS J3 test connector is a male (pins) 15 pin double density D-subminiature type, Positronics Industries (kit) part number ODD15M1OYOZ or the following individual parts:

Nomenclature (AMP)	Amp Part Number	Military Part Number
Connector Shell (HDP-22 Crimp Snap In Contact)	748364-1	reference MIL-C-24308
Size 22 DM Crimp Snap In Contacts Pin 0.030	748333-4 or -7	M39029/58-360
Backshell (Shielded Cable Clamp Assembly)	745854-5	
Jackscrews, 2 required (4-40 Male Jackscrew Kit)	747784-8	
Grommet Sets	747746-1	

The following tools will work with Positronics, Amp, and Mil Spec Connectors:

Insertion / Extraction Tool	91067-1	M81969/1-04
Hand Crimp Tool		M22520/2-01
Positioner		M22520/2-09

WinVIEWS OPERATION:

Windows Virtual Interface to the Enhanced Warning System

WinVIEWS software is a tool developed by Honeywell to monitor or view values within the EGPWS. The WinVIEWS software provides a monitor function that does not alter the operation of the EGPWS. The monitoring of values assists in the installation testing of the EGPWS by allowing the operator to quickly determine if the correct signal and scaling is being used by the EGPWS. Additionally, WinVIEWS provides a detailed status of the software configuration and input signals which enables quick identification of system anomalies.

The command file is a simple text file that should include each CVT Item used in this test procedure. A sample command file for this test procedure is found on the following page. The file must be a 'Text Only' type of file, such as those created in the Microsoft Windows NotePad program. It should have a filename extension of .CMD. Once this file is loaded, WinVIEWS can automatically display the current value of each parameter listed in the file.

Normal Operation for Ground Testing the EGPWS:

STEP 1 - Connect the PC to the EGPWS via the RS-232 cable as defined above.

STEP 2 - On the PC, start Windows 3.1, or higher.

STEP 3 - Start the WinVIEWS program.

STEP 4 - Under the File Menu select the "Load Command File" option and load the appropriate Command File.

STEP 5 - Use F6 to select Data Display Mode. Each CVT Item listed in the Command File will be continuously updated at a rate of greater than once per second. The values shown for the CVT Items listed will be the test values.

Command File: MK68_GTP.CMD The format for the WinVIEWS command file is:

1. ASCII Text Only; no spaces
2. A CVT Item as specified in the test procedure
3. Each CVT Item Name is followed by a <return> or <enter>

RawRA1
ARA1Val
DHDsc
RawBAlt1
RawBCAlt1
RawCAS1
RawBaroRt1
AUBaroVal
RawAACSAT
RawSAT1
ILSTuned1
AGS1Val
RawAACGS1
ALoc1Val
RawAACLoc1
RawGS1
RawLoc1
RawGLat1
GPSLatude1
RawGLng1
GPSLngude1
RawGAlt1
RawHFOM1
RawVFOM1
RawRoll1
RawPitch1

AnAtt1Val
RawAACMHD
AACMHdVal
RawIMHd1
LandFlDsc
MFlpOvrd
LandGrDsc
HiLandGrDsc
GndLandGrDs
GSCan
TerrDis
AudInhDsc
GPWSInhDsc
M6LwVolDsc
APEngDisc1
GSInh
StpAppSel
MomSASel
TAWxRng1
TAWxRng2
DispRngOut1
DispRngOut2
PosUncert
GPWInop
WSInop
TA_NotAvail

APPENDIX D

VENDOR CONTACT INFORMATION

APPENDIX D - Vendor Contact Information

Vendor Contact Information

The vendor contact information provided below is current at the time of publication of this document.

AMP	2800 Fulling Mill Road MS 038-035 Middletown, PA 17507 800 806-0480	http://www.amp.com
Amphenol	20 Melford Drive Scarborough, Ontario, Canada M1B 2X6 Ph: 416-291-4401 Fax: 416-292-0647	http://www.amphenol.com
Avidyne Corporation	55 Old Bedford Road Lincoln, MA 01773 Ph: 888-723-7592	http://www.avidyne.com
Avtech Corporation	3400 Wallingford Ave North Seattle, WA 98103 Ph: 206-634-2540	http://www.avtcorp.com
Barry Controls	Burbank, CA 818 843-1000 Brighton, MA 616 787-1555	**United Kingdom:** Surrey, England 44 (0932) 22-4122 **Germany:** Raunheim, Germany 49 (6142) 43077/8/9
BF Goodrich Aerospace	BF Goodrich Aircraft Sensors 14300 Judicial Road Burnsville, MN 55306-4898 Ph: 952-892-4000 Fax: 952-892-4800	http://www.bfg-aerospace.com
Computer Instruments Corp.	1000 Shames Drive Westbury, New York 11590 Ph: 516-876-8400 Fax: 516-876-9153	Email: info@computerinstruments.com http://www.computerinstruments.com
Comant	12920 Park Street Sante Fe Springs, CA 90670 Ph: 562-946-6694 Fax: 562-946-5150	Email: sales@comant.com http://www.comant.com
Dallas Avionics, Inc.	2525 Santa Anna Ave. Dallas, Texas 75228 Ph: 800-527-2581	distributor for Eaton switches http://www.dallasavionics.com
Eaton Corporation (see Dallas Avionics)	Lighted Switches, Displays 1640 Monrovia Avenue Costa Mesa, CA 92627 Ph: 800-300-9320	http://www.aerospace.eaton.com
EDMO Distributors Inc.	5505 E. Rutter Ave. Spokane, WA 99212-1333 Ph: 800-235-3300	distributor for STACO switches http://www.edmo.com

Electronic Cable Specialists and Electrical Conservation Systems, Inc.	5300 W Franklin Drive Franklin, WI 53132-8642 414 421-5300	http://www.ecsdirect.com
Electrical & Mechanical Technologies (EMTEQ)	S84 W18693 Enterprise Drive Muskego, WI 53150 PH: 262 679-6170 Fax: 262 679-6175 888 679-6170	Email: Sales@emteq.com http://www.emteq.com
Hollingsead International	Sante Fe Springs, CA 213 921-3436	http://www.hollingsead.com
IDD Aerospace	Redmond, WA 425 885-4353	
ITT Cannon	Santa Ana, CA 714 557-4700	
Korry Electronics	901 Dexter Avenue North Seattle, WA Ph: 800 257- 8921 Fax: 206 281-3576	Email: info@korry.com http://www.korry.com
Master Specialties Co.	Costa Mesa, CA 714 642-2427	
Mid-Continent Instruments		http://midcontinentinstruments.com
Norwich Aero Products		http://www.norwichaero.com
PIC Wire & Cable Supply	N53 W24747 S. Corporate Circle P.O. Box 330 Sussex, WI 53089-0330 414 246-0500 Fax: 414 246-0450	Email: BHackett@Picwire.com http://www.picwire.com
Positronic Industries	423 North Campbell Avenue Springfield, Missouri 65801	Email: info@positronic.com http://www.positronic.com
Sensor Systems, Inc.	8929 Fullbright Avenue Chatsworth, CA 91311 818 341-5366 Fax: 818 341-9059	http://www.sensorantennas.com
Shadin Co.	6831 Oxford Street St. Louis Park, MN 55426 Ph: 800-328-0584 Fax: 612-924-1111	http://www.shadin.com Email: sales@shadin.com
Spirent Systems **Penny & Giles Aerospace**	8710 E. 32nd Street N. Wichita, KS 67226 Ph: 316-636-2000 Fax: 316-636-9098	http://www.spirent-systems.com Email: denniss@pgaerospace.com
Staco Switch (see EDMO Distributors)	1139 Baker Street Costa Mesa, CA 92626-4191 Ph: 714-549-3041 Fax: 714-549-0930	http://www.stacoswitch.com

West Coast Specialties	P.O. Box 5010 Preston, WA 98050 Ph: 425 222-3118 Fax: 425-222-3119	**Contact:** Bruce Maxwell, (Rep) 206-232-2871 Fax: 206-232-3174

APPENDIX E

Interface Description Document

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9 DEFINITIONS **324**

APPENDIX E - Interface Description Document

1 INTRODUCTION

1.1 Part Number

This document is the Interface Description Document for the MK VI and MK VIII Enhanced Ground Proximity Warning System (EGPWS). The EGPWS computer (EGPWC) for these systems are identified by Honeywell part numbers:

965-1180-0XX	MK VI EGPWC	With upgraded CPU
965-1190-0XX	MK VI EGPWC	With upgraded CPU and internal GPS
965-1210-0XX:	MK VIII EGPWC	With upgraded CPU
965-1220-0XX:	MK VIII EGPWC	With upgraded CPU and internal GPS

Differences, where they exist, between the different part numbers, are highlighted within this document.
The EGPWC 10 digit part number will identify the configuration of the EGPWC as follows:
965-1ABC-DDD (example 965-1180-020)
A = 1 (MK VI) or 2 (MK VIII)
B = Functionality of hardware (with or without internal GPS or Upgraded CPU). Refer to part number list above for details.
C = MK VI or MK VIII EGPWC hardware (including boot code). C = 0 as hardware part numbers roll.
DDD = Application Software (including Configuration Software)
The Terrain Database (including the Envelope Modulation Database) Version is not identified in the 10-digit part number but with a separate identifier on the nameplate.
All modification changes not affecting form, fit or function will be identified via “mod dots”.
The digits identifying the Application software will match the respective version number of the Application software.

1.2 Purpose

The Interface Description Document describes all of the system external interfaces for the MK VI and MK VIII Enhanced Ground Proximity Warning System (EGPWS).

1.3 System Overview

Refer to the EGPWS Product Specification document referenced in section 2.

1.4 Document Overview

This document is organized as follows.

Section 1	Introduction, identifies this Description Document and describes the content and organization of the document.
Section 2	Referenced Documents.
Section 3	Mechanical Interface, summarizes the outline, mounting tray outline and weight of the EGPWS.
Section 4	Electrical Interface, summarizes the number and type of electrical interfaces available.
Section 5	Aircraft Application Data, specifies the available interfaces as well as specific data provided on each interface
Section 6	Input Data Definition, provides definition of digital and analog input characteristics.
Section 7	Output Data Definition, describes the characteristics of the EGPWC outputs.
Section 8	Connector Interface, describes pin out and function for the front panel connectors.
Section 9	Definitions, provides a list of acronyms.

2 REFERENCES

MK VI/MK VIII EGPWS Product Specification	965-1180-601
MK VI/MK VIII EGPWS Pilot Guide	060-4314-000
MK VI/MK VIII EGPWS Line Maintenance Manual	060-4199-180
MK VI/MK VIII EGPWS Terrain Database	060-4326-000
EGPWS Interface Methodology	060-4303-000

3 MECHANICAL INTERFACE

3.1 Weight

The maximum weight for all MK VI and MK VIII EGPWC part numbers is 3.9 pounds.

3.2 System Interface Components

Refer to section 3.3 for outline drawings.

3.2.1 EGPWC Mounting

The mounting rack for the EGPWC is identified as follows:

TRAY		
Honeywell P/N	Source/Vendor	Vendor Part Number
405-0383-001	Bendix/King	071-04003-0002

3.2.2 EGPWC Connectors

There are two connectors that interface the aircraft with the MK VI and MK VIII EGPWC. The 78-pin (J1) and 50 pin (J2) front panel interface connectors of the MK VI and VIII EGPWC contain all the interfaces for signals and power. The 78 pin is a Subminiature-D, High-Density Series connector conforming to Mil-C-24308. The 50 pin is a Subminiature-D Connector conforming to Mil-C-24308.

P1 78 pin Connector		
Vendor/Supplier	Supplier P/N	Honeywell P/N
Positronics	DD78F10JVLC-15	440-1158-009

P2 50 pin Connector		
Vendor/Supplier	Supplier P/N	Honeywell P/N
Positronics	RD50F10JVLC-15	440-1233-001

A GPS Antenna connector is required for Enhanced MK VI and MK VIII units with internal GPS receiver.

GPS Connector		
Vendor/Supplier	Supplier P/N	Honeywell P/N
AMP	225554-6	440-1239-001

For a pictoral of the front panel connectors, see Figure 8.1-1 and 8.1-2. Also, refer to Section 8 for pin-out information. A test connector (J3) is provided on the EGPWC front panel. This provides access for a PC test monitor and future portable data loading capabilities. The mating connector for the EGPWC test plug is a male (pins) 15 pin double density D-subminiature type, Positronics Industries (kit) part number ODD15M1OYOZ or the following individual parts:

Nomenclature (AMP)	**Amp Part Number**	**Military Part Number**
Connector Shell (HDP-22 Crimp Snap In Contact)	748364-1	reference MIL-C-24308
Size 22 DM Crimp Snap In Contacts Pin 0.030	748333-4 or –7	M39029/58-360
Backshell (Shielded Cable Clamp Assembly)	745854-5	
Jackscrews (4-40 Male Jackscrew Kit)	747784-8 (specify quantity of 2 per connector)	
Grommet Sets	747746-1	

The following tools will work with Positronics, Amp, and Mil Spec Connectors:

Insertion / Extraction Tool	91067-1	M81969/1-04
Hand Crimp Tool		M22520/2-01
Positioner		M22520/2-09

3.2.3 Configuration Module

The EGPWS aircraft configuration is programmed into a configuration module installed in the aircraft wiring. This configuration module is identified as follows:

Vendor/Supplier	Supplier P/N
Honeywell	700-1710-001
Honeywell	700-1710-020 *

The configuration module is installed as part of the P2 mating connector backshell and contains reprogrammable memory for configuration storage.

Configuration module part number 700-1710-020, contains a Real Time Clock (RTC) circuit that supplies the EGPWS with date and time to allow the internal GPS receiver to determine GPS constellation shift and provide faster satellite signalacquistion and navigation. The Configuration module, part number 700-1710-020, will only operate with EGPWC hardware part numbers 965-1180, 965-1190, 965-1210, 965-1220 **and** software versions -020 or later.

Configuration module, part number 700-1710-001, can be used with all EGPWC hardware part numbers and software versions.

3.3 Outline

Dimensions of the MK VI and MK VIII EGPWC hardware and their associated mounting rack are given in this section. The mounting rack is identical to that of the MK VI GPWC.

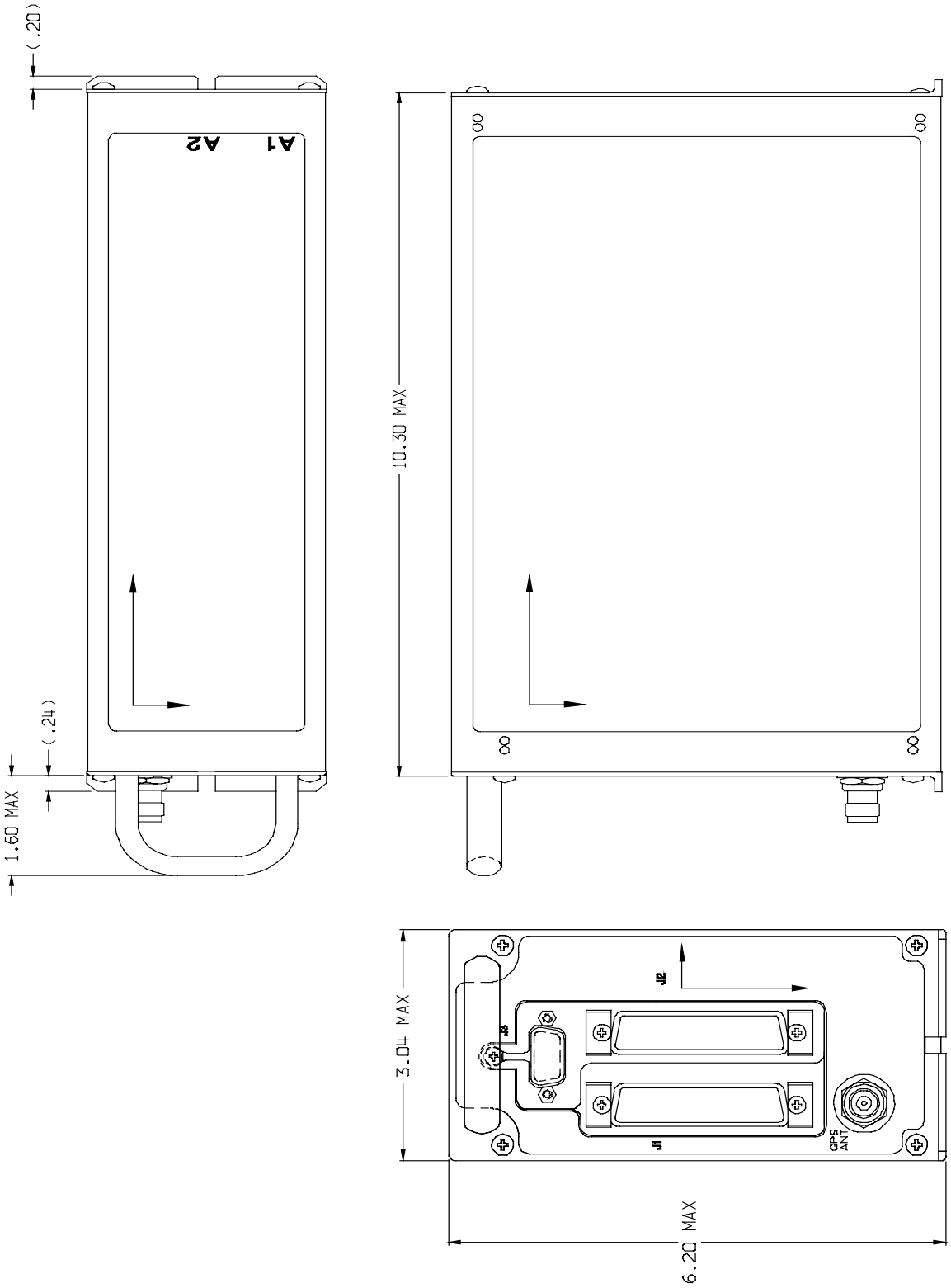


FIGURE 3.3-1: OUTLINE DRAWING FOR THE MK VI AND MK VIII EGPWC

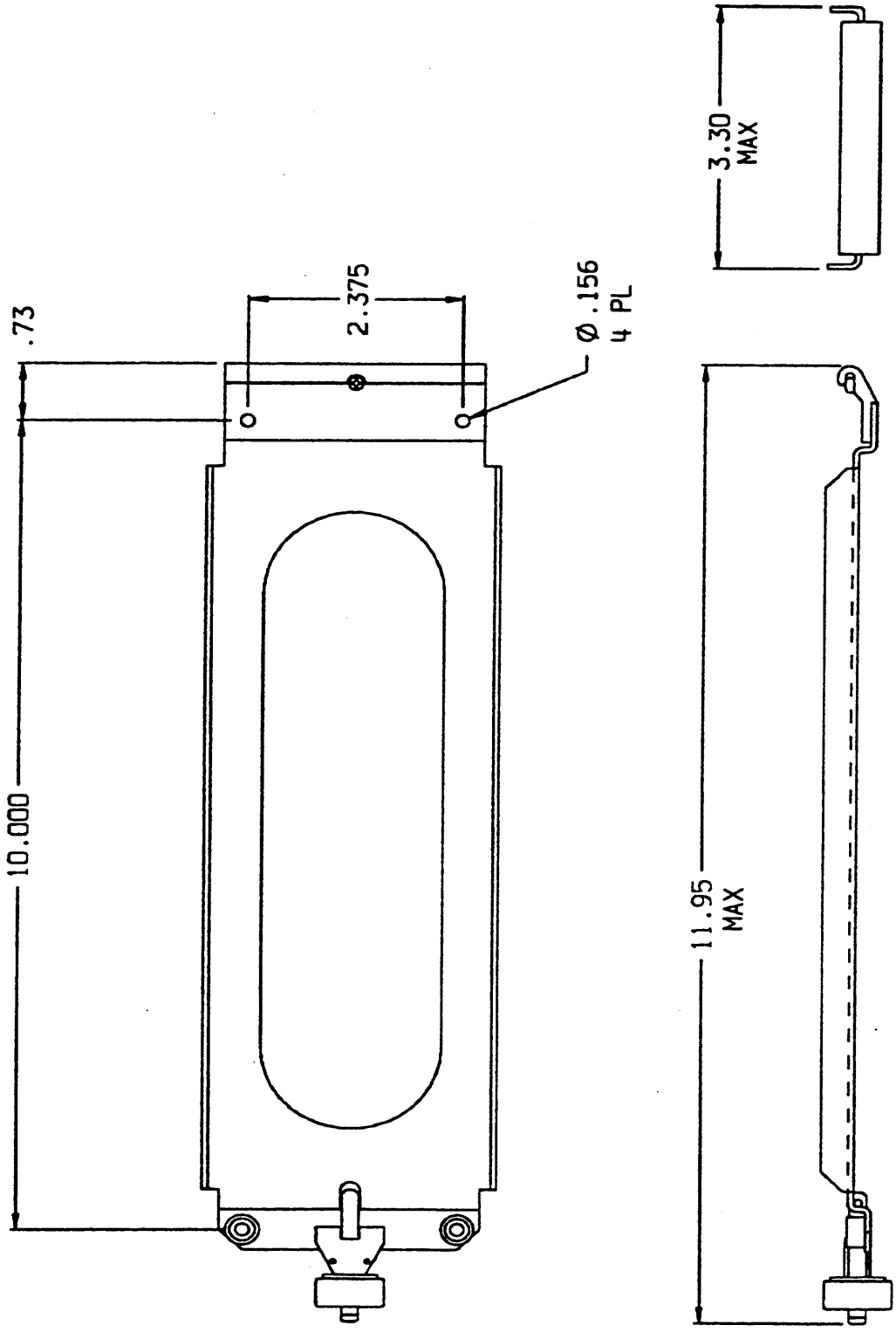


FIGURE 3.3-2: MOUNTING RACK FOR THE MK VI AND MK VIII EGPWC

4 ELECTRICAL INTERFACE

4.1 Introduction

The MK VI and MK VIII EGPWS provide electrical interfaces for aircraft systems and to support maintenance functions. The interfaces are made via the front panel aircraft interface connectors, front panel maintenance/test port and front panel LED's. A TNC coaxial connector is located on the front panel for internal GPS receivers in the 965-1190-0XX MK VI EGPWC, and 965-1220-0XX MK VIII EGPWC only. The following sections describe the types of electrical interfaces provided in the EGPWC. See Section 5 for the specific interface configuration capabilities of the MK VI and MK VIII EGPWS.

4.2 Signal Interfaces

This section identifies and describes the number and characteristics of each interface type provided in the front panel aircraft interface connectors. The aircraft interface connectors are defined as P1 (78 pins) and P2 (50 pins). Section 8 identifies the connector pin assignments. The signal mnemonic for each signal in Section 8 is included in the following sections. All synchro inputs are brought in as three or five wire devices. No two wire absolute AC signals are available. All analog inputs provide broken wire detection on all input signal legs. Unless otherwise stated, the "Maximum reverse fault current" is defined as the current resulting from an internal component failure, with the input signal at zero volts.

4.2.1 Grounds

4.2.1.1 Chassis Ground

Used for redundant metal connection. This pin is internally connected to DC Ground (see section 4.2.1.2).

Pin Assignment (Signal Mnemonic):	J1-42, J1-53	(GND)

4.2.1.2 DC Ground

For discrete inputs and lamp driver outputs. These pins are also internally connected to Chassis Ground (see section 4.2.1.1).

Pin Assignment (Signal Mnemonic):		
(same as +28 VDC Return)	J1-41, J1-61	(PWR_L)

NOTE: All analog signals are differential input.

4.2.2 Primary Power Input

Nominal Input	28 VDC
Normal Voltage Range	22.0 to 30.3 VDC
Normal Surge Voltage Range	15 to 40VDC (30 mSec)
Abnormal Voltage Range	20.5 to 32.2 VDC
Abnormal Surge Voltage Range	37.8 VDC (1sec); 46.3 VDC (100 mSec)
Normal Frequency Range	not applicable
Frequency Transients	not applicable
Power Requirements	9 Watts - No Warnings +7 Watts with warning voice over 8 Ω speaker +3 Watts with Internal GPS (includes antenna power)[1] +49 Watts (typical) with heater blanket on[2]
Recommended Power Control Device	3 Amp delayed action circuit breaker.
Pin Assignment (Signal Mnemonic):	
+28 VDC Input	J1-40, J1-60 (PWR_H[3])
+28 VDC Return	J1-41, J1-61 (PWR_L[3])

[1] Based on the Honeywell GPS Pxpress card specification and applies to 965-1190-0XX and 965-1220-0XX only.
[2] The heater blanket turns on at temperatures ≤ -23° C and turns off at temperatures ≥ -20° C.
[3] Note that this is not a floating input. +28 VDC must be applied to both PWR_H and +28 VDC Return to both PWR_L inputs.

4.2.3 DC Analog Inputs

Unless otherwise specified, Input Signal accuracy is 1% linearity +0.1% full scale offset.

4.2.3.1 Radio Altitude

Quantity	1	
Input Impedance, each leg	> 83 KΩ	
Maximum Reverse Fault Current	< 200 µA	
Signal Range	0 to 2500 feet	
Input Voltage Range (V_{RA})	$37.7V \geq V_{RA} \geq -2.5V$	
Conversion Range (V_C)	$29.7V \geq V_C \geq -0.4V$	
Input Filter	0.1 Second Low Pass, ± 10%	
Broken Wire Detect	Input will be biased to less than -50 feet	
Pin Assignment (Signal Mnemonic):		
Signal (+)	J1-64	(RALT_H)
Return (-)	J1-45	(RALT_L)

4.2.3.2 Low Level Glideslope

Quantity	1	
Input Impedance, each leg	> 2.5 MΩ	
Reverse Fault Current	< 6.2 µA	
Signal Range	±12 Dots	
Input Voltage Range	±0.9 VDC	
Input Filter	0.1 Second Low Pass, ± 10%	
Input Type	Differential	
Common Mode Voltage Range (V_{CM})	$11V \geq V_{CM} \geq -2V$	
Broken Wire Detect	Input will be biased less than -15 dots	
Pin Assignment (Signal Mnemonic):		
+Up, Below Beam, Fly Up	J1-65	(GSDEV_H)
+Down, Above Beam, Fly Down	J1-46	(GSDEV_L)

4.2.3.3 Localizer Deviation or Low Level Glideslope Validity

This input can be configured as either a low level glideslope valid, or as a localizer deviation input. Installations that only have the low level validity signal for glideslope can not activate the analog localizer input. See section 5.3.9 for more information.

Quantity	1	
Input Impedance, each leg	> 2.5 MΩ	
Reverse Fault Current	< 6.2 µA	
Input Filter	0.1 Second Low Pass, ± 10%	
Input Type	Differential	
Common Mode Voltage Range (V_{CM})	$11V \geq V_{CM} \geq -2V$	
<u>When used as a validity input:</u>		
Pin Assignment (Signal Mnemonic):		
+ Flag	J1-30	(GS_VAL_H)
– Flag	J1-10	(GS_VAL_L)
Active Voltage Range (Logic True)	+160 to +840 mVDC	
Inactive Voltage Range (Logic False)	0 to 50 mVDC	
Broken Wire Detect	Input will be biased less than –1 VDC	
<u>When used as a localizer input:</u>		
Pin Assignment (Signal Mnemonic):		
CRS DEV + Fly Right	J1-30	(LCDEV_H)
CRS DEV + Fly Left	J1-10	(LCDEV_L)
Signal Range	±12 Dots	
Input Voltage Range	±0.9 VDC	
Broken Wire Detect	Input will be biased less than -15 dots	

4.2.3.4 Barometric Altitude

Quantity	1	
Input Impedance, each leg	> 83 KΩ	
Reverse Fault Current	< 200 µA	
Input Voltage Range	-0.18 VDC to +15 VDC	
Input Filter	0.1 Second Low Pass, ± 10%	
Input Type	Differential	
Broken Wire Detect	Input will be biased less than -3000 feet	
Pin Assignment (Signal Mnemonic):		
Signal (+)	J1-62	(ALT_H)
Return (-)	J1-43	(ALT_L)

4.2.3.5 Outside Air Temperature

Quantity	1	
Input Impedance, each leg	> 100 KΩ	
Reverse Fault Current	< 200 µA	
Input Voltage Range	+0.3 VDC to +0.6 VDC	
Input Filter	0.1 Second Low Pass, ± 10%	
Input Type	Differential	
Broken Wire Detect	Input will be biased less than -80° C	
Pin Assignment (Signal Mnemonic):		
Signal (+)	J1-63	(OAT_H)
Return (-)	J1-44	(OAT_L)

NOTE: For temperature probe voltage reference see section 4.2.10.

4.2.3.6 Configuration Defined DC Inputs

Quantity	2
Input Impedance, each leg	> 83 KΩ
Reverse Fault Current	< 200 µA
Input Voltage Range	±5 VDC
Input Filter	0.1 Second Low Pass, ± 10%
Input Type	Differential
Broken Wire Detect	Input will be biased less than -6 VDC
Pin Assignment (Signal Mnemonic):	
#1 Signal (+)	J1-26
#1 Return (-)	J1-27
#2 Signal (+)	J1-66
#2 Return (-)	J1-47

4.2.4 AC Analog Inputs

Unless otherwise specified

Input Impedance: X leg	> 140 KΩ
Input Impedance: Y leg	> 140 KΩ
Input Impedance: Z leg	> 140 KΩ
Maximum Reverse Fault Current	< 200 µA
Input Voltage Range	±11.8 VAC_{RMS} ± 20% (leg to leg)
Accuracy	2.5% linearity + 0.1% full scale offset

4.2.4.1 Synchro Roll Attitude

Quantity	1	
Synchro Angle Range	±80 deg	
Reference Voltages	Not Required	
Pin Assignment (Signal Mnemonic):		
X leg	J1-1	(SYN_1X)
Y leg	J1-21	(SYN_1Y)
Z leg	J1-2	(SYN_1Z)

4.2.4.2 Synchro Magnetic Heading

Quantity	1	
Synchro Angle Range	±180 deg	
Reference Voltages	±26 VAC_{RMS} ± 20% (see 4.2.4.4)	
Pin Assignment (Signal Mnemonic):		
X leg	J1-22	(SYN_2X)
Y leg	J1-23	(SYN_2Y)
Z leg	J1-3	(SYN_2Z)

4.2.4.3 Synchro Pitch Attitude

Quantity	1	
Synchro Angle Range	±80 deg	
Reference Voltages	Not Required	
Pin Assignment (Signal Mnemonic):		
X leg	J1-5	(SYN_3X)
Y leg	J1-7	(SYN_3Y)
Z leg	J1-6	(SYN_3Z)

4.2.4.4 Configuration Defined Synchro Inputs

Quantity	2	
Reference Voltages	±26 VAC_{RMS} ± 20%	
Pin Assignment (Signal Mnemonic):		
#2 X leg	J2-1	(SYN_4X)
#2 Y leg	J2-2	(SYN_4Y)
#2 Z leg	J2-18	(SYN_4Z)
#3 X leg	J2-19	(SYN_5X)
#3 Y leg	J2-20	(SYN_5Y)
#3 Z leg	J2-3	(SYN_5Z)

4.2.4.5 Signal Timing Reference Inputs

These inputs accept 400 Hz AC signals, and detect the "zero crossings" of these signals. These zero crossings are used to time the conversion and input of AC signals. Absolute voltage level of these signals is not measured, but it must be within the range specified below. Voltage below the specified minimum value may result in intermittent or "jittery" zero cross detection.

Timing reference signals are required for input of most AC devices (not required for pitch and roll). These references can be brought into the appropriate timing reference input, or the system can be configured to derive a reference from the signal. Timing reference signals are specified for synchro inputs requiring a range greater than ± 80 degrees. Inputs requiring less (i.e., Roll Attitude) are configured to derive a reference from the synchro input signal and do not require a separate reference voltage input.

Quantity	2	
Input Impedance	> 140KΩ each line to signal ground	
Maximum Reverse Fault Current	< 120 µA	
A/C Input Signal Frequency Range	400 Hz, ±10%	
Maximum Input Voltage Swing (differential)	50V between input legs	
Maximum Input Voltage Swing (ref. to Gnd)	50V from any leg to signal ground	
Input Hardware Filtering	None	
Minimum Input Voltage	± 0.5 VAC	
Pin Assignment (Signal Mnemonic):		
26VAC Reference #1 H	J1-4	(26REF_1H)
26VAC Reference #1 C	J1-24	(26REF_1L)
26VAC Reference #2 H	J2-34	(26REF_2H)
26VAC Reference #2 C	J2-35	(26REF_2L)

4.2.5 ARINC 429/575 Digital Serial Bus Inputs

Quantity	8	
Format	DITS, ARINC 429/575 Low or high speed [1]	
Low Speed Data Rate	12.0 KBPS to 14.5 KBPS	
High Speed Data Rate	100 KBPS ± 1%	
Direction of Information Flow	Type 'A' broadcast for ARINC 429/575	
Word/Frame Structure	Type 'B' 32 bit words consisting of 8 bits label and 24 bits data/status	
Data definition	Refer to Section 6 of this document	
Channel	Pin Assignment	(Signal Mnemonic):
Receive #1 A leg	J2-37	(429/422RX_1A)
Receive #1 B leg	J2-36	(429/422RX_1B)
Receive #2 A leg	J2-39	(429RX_2A)
Receive #2 B leg	J2-38	(429RX_2B)
Receive #3 A leg	J2-41	(429RX_3A)
Receive #3 B leg	J2-40	(429RX_3B)
Receive #4 A leg	J2-25	(429RX_4A)
Receive #4 B leg	J2-8	(429RX_4B)
Receive #5 A leg	J2-21	(429RX_5A)
Receive #5 B leg	J2-4	(429RX_5B)
Receive #6 A leg	J2-22	(429RX_6A)
Receive #6 B leg	J2-5	(429RX_6B)
Receive #7 A leg	J2-23	(429RX_7A)
Receive #7 B leg	J2-6	(429RX_7B)
Receive #8 A leg	J2-24	(429RX_8A)
Receive #8 B leg	J2-7	(429RX_8B)
SSM/SDI Definition:	Refer to Section 6.2 of this document	

4.2.6 RS-232 / RS-422 Digital Serial Bus Inputs

Two full duplex RS-232 / RS-422 buses and a third RS-422 receiver are provided at the aircraft interface connectors. The RS-422 transceivers are electrically multiplexed with the RS-232 transceivers, and are selected through the configuration process. The third RS-422 receiver is electrically multiplexed with the ARINC 429 channel 1 receiver. The maintenance RS-232 bus is described in section 4.3.1. The specific characteristics (data rate, parity, data bits, stop bits) is defined in the configuration selection, see Section 5 and 6 for details. RS-422 cable termination will not be required for typical applications, see TIA/EIA-422-B Annex A.

The RS-232 bus meets the characteristics specified in RS232C and supports the following characteristics:

Data Rate	1200, 2400, 4800, 9600, 19200 or 38400 bits/Sec
Parity	None, Odd or Even
Data bits	7 or 8
Stop bits	1 or 2
Maximum Recommended Cable Length	15 meters
Data definition	Refer to Section 6 of this document

The RS-422 bus meets the characteristics of TIA/EIA-422-B and supports the following characteristics:

Data Rate	1200, 2400, 4800, 9600, 12000, 19200 or 38400 bits/Sec
Maximum Transceivers on Bus	20
Receiver Input Impedance	12 KΩ
Word/Frame Structure	Refer to Section 6 of this document
Data definition	Refer to Section 6 of this document

[1] The bus speed is defined in the configuration selection, see Section 5 for details.

4.2.6.1 GPS RS-232 Digital Serial Bus (serial port 3)

One port is provided for use with external or internal RS-232 GPS interfaces. This port is common with the GPS RS-422 port described in Section 4.2.6.2 and can only function as a RS-232 interface or a RS-422 interface but not both.

Pin Assignment (Signal Mnemonic):

Transmit	J2-45	(GPS_TXA)
Receive	J2-29	(GPS_RXA)
Common	J2-28	(GND)

NOTE: If an internal GPS configuration is used (965-1190-0XX or 965-1220-0XX) then the receive input will be non-functional.

4.2.6.2 GPS RS-422 Digital Serial Bus (serial port 3)

One port is provided for use with external GPS interfaces. This port is common with the GPS RS-232 port described in Section 4.2.6.1 and can only function as a RS-232 interface or a RS-422 interface but not both.

Pin Assignment (Signal Mnemonic):

Transmit A leg	J2-45	(GPS_TXA)
Transmit B leg	J2-46	(GPS_TXB)
Receive A leg	J2-29	(GPS_RXA)
Receive B leg	J2-12	(GPS_RXB)

NOTE: If an internal GPS configuration is used (965-1190-0XX or 965-1220-0XX) then the receive input will be non-functional.

4.2.6.3 Air Data RS-232 Digital Serial Bus (serial port 2)

One port is provided for use with Air Data computer or Static Pressure Sensor interfaces. This port is common with the Air Data RS-422 port described in Section 4.2.6.4 and can only function as a RS-232 interface or a RS-422 interface but not both.

Pin Assignment (Signal Mnemonic):

Transmit	J2-27	(ADC_TXA)
Receive	J2-11	(ADC_RXA)
Common	J2-28	(GND)

4.2.6.4 Air Data RS-422 Digital Serial Bus (serial port 2)

One port is provided for use with Air Data computer or Static Pressure Sensor interfaces. This port is common with the Air Data RS-232 port described in Section 4.2.6.3 and can only function as a RS-232 interface or a RS-422 interface but not both.

Pin Assignment (Signal Mnemonic):

Transmit A leg	J2-27	(ADC_TXA)
Transmit B leg	J2-44	(ADC_TXB)
Receive A leg	J2-11	(ADC_RXA)
Receive B leg	J2-10	(ADC_RXB)

4.2.6.5 SCI Range RS-422 Digital Serial Bus (serial port 1)

Two ports are provided for use with the SCI range bus interfaces. Port 1 is common with the ARINC 429 channel 1 port described in Section 4.2.5 and can only function as a RS-422 interface or an ARINC 429 interface but not both. Port 2 is common with the RS-232 port described in Section 4.2.6.4 and can only function as a RS-422 interface or an RS-232 interface but not both.

Pin Assignment (Signal Mnemonic):

Receive A leg	J2-36	(429/422RX_1B)
Receive B leg	J2-37	(429/422RX_1A)
Receive A leg	J2-10	(232/422RX_2A)
Receive B leg	J2-11	(232/422RX_2B)

Note: SCI Display Range RS-422 bus A and B legs are reversed from ARINC 429.

4.2.7 Discrete Inputs

Discrete signals are intended for remote switching through the aircraft, and are therefore subject to being connected to other signals, and are also subject to transient voltage conditions. For these reasons, the following rules apply to each input, unless otherwise stated.

Each input is capable of withstanding voltage transients of ± 600VDC for 10 µs and ± 50VDC continuously, without damage. The +28 VDC discretes are internally biased via a pull down resistor, and are externally pulled up to +28VDC when active. The characteristics of each +28 VDC discrete input are as follows:

+28 VDC Discrete Characteristics	
Quantity	13
Active Voltage Range (Logic True)	> +17 VDC
Inactive Voltage Range (Logic False)	< +4.4 VDC
Diode Isolation	None
Input Impedance	> 95 KΩ
Maximum Fault Current	< 60 µA
Pin Assignment (Signal Mnemonic):	See specific discrete in Category 13 (28V_DISC_xx)

The Ground discretes are internally biased via a pull up resistor, and are externally pulled down to ground when active. The characteristics of each Ground discrete input are as follows:

Ground Discrete Characteristics	
Quantity	15
Active Voltage Range (Logic True)	< +3 VDC
Inactive Voltage Range (Logic False)	> 100 KΩ (to ground) or > +3.5 VDC
Diode Isolation	Each input is diode isolated to prevent current sinking
Input Impedance	> 10 KΩ
Maximum Fault Current	< 100 µA (at +28 VDC input)
Pin Assignment (Signal Mnemonic):	See specific discrete in Category 13 (GND_DISC_xx)

4.2.8 Configuration Module Interface

System configuration is defined via a Configuration Module, which resides in the MK VI/VIII EGPWS aircraft wiring harness backshell. The EGPWS Configuration Module contains the aircraft interface and functionality definitions specific to the installed aircraft. Refer to Section 5 for interface and functional definitions by category. Note that both configuration module part numbers, 700-1710-003 and 700-1710-020, have identical electrical interfaces.

Electrical Characteristics	Refer to the EGPWS Configuration Module specification	
Data definition	Refer to the EGPWS Configuration Module specification	
Pin Assignment (Signal Mnemonic):		
Clock	J2-32 (RED)	(SPICLK)
Master Data Out	J2-50 (BLK)	(SPIMOSI)
Master Data In	J2-33 (ORN)	(SPIMISO)
Configuration Module Select	J2-49 (WHT)	(SPISEL_CM#)
Configuration Module +5VDC	J2-17 (VIO)	(SC_PWR)
Configuration Module +5VDC Return	J2-16 (BLU)	(GND)

Output to Config Module	Logic Low (nominal)	Logic High (nominal)
	EMK 6/8	EMK 6/8
Clock Out	0 V	5 V
Master Data Out	0 V	5 V
Config Module Select	0 V	5 V

INTERFACE OF EGPWS OUTPUTS TO CONFIGURATION MODULE

4.2.9 GPS Antenna Input

A GPS input connector is available on the front of the MK VI EGPWS (965-1190-0XX only) and MK VIII EGPWS (965-1220-0XX) only.

Quantity	1
Cable Length/Allowed Signal Loss	Not more than 8 dB, at 1575.42 MHz, for cable and connector loss from antenna to unit.

Connector Type	TNC
Low Level DC on RF Output	+5 VDC ±5%, 50 mAmps maximum, Shield Ground.
Pin Assignment (Signal Mnemonic):	GPS ANT (COAX)

4.2.10 OAT Voltage Reference Output

This output is an accurate voltage source for 500 Ω resistive temperature sensors.

Quantity	1
Output Voltage	5.000 VDC ±10 mVDC (no load)
Nominal Load	500 Ω
Pin Assignment (Signal Mnemonic):	J1-25 (OAT_REF)

NOTE: This output has a source impedance of 4.42 KΩ, 0.1%.

4.2.11 Lamp Driver Outputs

The MK VI and MK VIII EGPWC support two kinds of Ground/Open discrete outputs used to signal various discrete conditions. Monitor outputs are used to signal failure conditions for the MK VI and MK VIII EGPWC. Monitor outputs default to an active state when there is a failure or if power is removed from the MK VI or MK VIII EGPWC. The other Lamp Driver outputs are used to signal the alert or mode control status of the MK VI and MK VIII EGPWS.
Short-term current limit protection is provided on all drivers for output shorting conditions. Ground going output discretes may be connected together to produce a "wired OR" function for the active low state of the signals. If output discretes are "wired Or'd" then diodes must be installed for isolation.

4.2.11.1 Monitor Output Characteristics

Quantity	3
Type of Output:	Switch Closure to Ground
Max. Open Circuit Voltage:	30 VDC
Current Limit	1 A
Potential Across "Closed" Switch:	2.5 VDC Max
Pin Assignment (Signal Mnemonic):	See specific output in Category 13 (MON_OUT_xx)

NOTE: Intended to operate with +28VDC lamp sources and will not operate with +5VDC lamp sources.

4.2.11.2 Discrete Output Characteristics

Quantity	9
Type of Output:	Switch Closure to Ground
Max. Open Circuit Voltage:	30 VDC
Current Limit	500 mA (typical)
Potential Across "Closed" Switch:	1 VDC Max
Pin Assignment (Signal Mnemonic):	See specific output in Category 13 (DISC_OUT_xx)

NOTE: Intended to operate with +28VDC pullup external to the EGPWS.

4.2.12 Audio Outputs

There are two audio outputs provided one 8-ohm output and one 600-ohm output. There are several possible volume levels available with the MKVI and MK VIII EGPWS as shown below, with maximum output being 4W (8Ω) or 100mW (600Ω). The actual audio level output by the EGPWS is dependent on several items:

- Selection of nominal alert audio volume level (max, -6, -12, -18 or -24 dB) via Category 14. (Section 5.3.14)
- If a 'soft' Glideslope alert is being issued (given 6 dB below nominal alert volume level).
- If a Self Test is in progress, alerts are given 6 dB below nominal alert volume level.
- Selection of Mode 6 Low Volume Discrete (lowers callout volume by 6 dB - See Section 5.3.13).

4.2.12.1 High Level (Speaker) Audio Output

The 8-ohm output is capable of driving a speaker directly but can also be used to drive other devices with equal or higher impedance.

Quantity	1	
Maximum Power Output	4 Watts Nominal	
Nominal Output Impedance	8Ω	
Load Impedance	8Ω or greater	
Number of Available Power Output Levels	5 selectable levels excluding the Mode 6 Audio Reduction function	
Pin Assignment (Signal Mnemonic):		
Signal (+)	J1-70	(AUD_HL_H)
Return (-)	J1-71	(AUD_HL_L)

4.2.12.2 Low Level (Interphone) Audio Output

The 600-ohm output is capable of driving one 600-ohm load at the specified level (or at a reduced level). This output is primarily designed for headphones and interphone systems.

Quantity	1	
Nominal Output Impedance	600Ω ±10%	
Maximum Single Channel Power Output	100 mW Nominal	
Available Power Output Levels	5 selectable levels excluding the Mode 6 Audio Reduction function	
Pin Assignment (Signal Mnemonic):		
Signal (+)	J1-75	(AUD_LL_H)
Return (-)	J1-74	(AUD_LL_L)

4.2.13 ARINC Digital Serial Output Buses

4.2.13.1 ARINC 429 Output Bus

The ARINC 429 output buses are defined in the terrain display select Section 5.3.6.3, output 429 bus group.

Quantity	2	
Format	DITS, ARINC 429	
Low Speed Data Rate	12.0 KBPS to 14.5 KBPS	
High Speed Data Rate	100 KBPS ± 1%	
Direction of Information Flow	Type ‘A’ broadcast for ARINC 429	
Word/Frame Structure	Type ‘B’ 32 bit words consisting of 8 bits label and 24 bits data/status	
Data definition	Refer to Section 7	
Pin Assignment (Signal Mnemonic):		
Bus #1 (A leg)	J2-43	(429TX_1A)
Bus #1 (B leg)	J2-42	(429TX_1B)
Bus #2 (A leg)	J2-26	(429TX_2A)
Bus #2 (B leg)	J2-9	(429TX_2B)

4.2.13.2 ARINC 453 Output Bus

Quantity	2	
Format	1600 bit Manchester BI-phase per ARINC 708A	
Data Rate	1 Mb per second	
Word/Frame Structure	Refer to Section 7.2	
Data definition	Refer to Section 7.2	
Pin Assignment (Signal Mnemonic):		
Bus #1 (A leg)	J1-58	(KCPB_1A)
Bus #1 (B leg)	J1-59	(KCPB_1B)
Bus #2 (A leg)	J1-56	(KCPB_2A)
Bus #2 (B leg)	J1-57	(KCPB_2B)

4.3 Front Panel Test Interface

The MK VI and MK VIII EGPWS provide a 15 pin (double density, D-Sub) test connector on the front panel, which provides interfaces for various test and maintenance functions. This connector provides the following interfaces.

4.3.1 RS-232 Maintenance Port (serial port 4)

One port is provided which meets the characteristics specified in RS232C. This bus can be used to read internal data from the MK VI or MK VIII EGPWS for both bench, and aircraft testing or transmitting configuration data for selected EGPWS interfaces and options.

Baud Rate	19,200	
Parity	None	
Data bits	8	
Stop bits	1	
Maximum Recommended Cable Length	15 meters	
Pin Assignment (Signal Mnemonic):		
Transmit	J3-4	(RS232TXD_MON)
Receive	J3-3	(RS232RXD_MON)
Common	J3-1	(GND)

4.3.2 PCMCIA / SmartCable Port

One port is provided which meets the Motorola SPI characteristics. The PCMCIA / SmartCable interface allows for both the uploading, and downloading of internal MK VI and MK VIII EGPWS information. Using this interface system, software and databases can be updated. Control of the upload/download process is accomplished by connection of the SmartCable to the MK VI or MK VIII EGPWS front panel test connector and insertion of the PCMCIA card. LEDs are provided on the SmartCable for PCMCIA interface operation. The PCMCIA / SmartCable is not intended as an on-line/in-flight storage medium and must be removed after completion of the upload/download operation.

Electrical Characteristics	Refer to the Motorola SPI specification	
Data definition	Refer to the Motorola SPI specification	
Maximum Recommended Cable Length	2 meters	
Pin Assignment (Signal Mnemonic):		
Clock	J3-7	(SPICLK)
Master Data Out	J3-9	(SPIMOSI)
Master Data In	J3-8	(SPIMISO)
SmartCable Select	J3-10	(SPISEL_SC#)
SmartCable +5VDC	J3-6	(SC_PWR)
SmartCable +5VDC Return	J3-1	(GND)
PCMCIA Card Present	J3-2	(CARD_PRES#)
SmartCable Ground	J3-12, -13, -14	(GND)

NOTE: SmartCable +5VDC Return is common with RS-232 Maintenance Port common.

4.3.3 GSE Present Discrete Input

A discrete input for test and Ground Support Equipment is provided. Grounding this pin indicates to the EGPWS that test or Ground Support Equipment is connected to the computer.

Active Threshold Voltage (Logic True)	< 0.8 VDC	
Inactive Threshold Voltage (Logic False)	> 2.0 VDC	
Input Impedance	> 20 KΩ	
Maximum Fault Current	< 500 µA	
Pin Assignment (Signal Mnemonic):	J3-11	(GSE_PRES#)

4.4 Front Panel Status Indicators

The MK VI and MK VIII EGPWC front panel provides three LEDs for indicating system and LRU status. A yellow LED labeled “EXTERNAL FAULT” is activated when a signal fault external to the MK VI or MK VIII EGPWC is detected. A green LED labeled “COMPUTER OK” is activated when the MK VI or MK VIII EGPWC itself is okay. A red LED labeled “COMPUTER FAIL” is activated when the MK VI or MK VIII EGPWC has detected an internal computer fault. Refer to Product Specification 965-1180-601 for a detailed discussion of status indications, recommended maintenance actions, Self Test activation and response.

5 AIRCRAFT APPLICATION DATA

This section describes the MK VI and MK VIII EGPWS interfaces for aircraft applications. Section 5.1 is a listing of the selection categories defining the various aircraft sensor interfaces and EGPWS functional options. Section 5.2 describes how the Category ID's are selected and programmed for the interface to aircraft sensors and EGPWS functional options. Section 5.3 and its sub-sections define the specific aircraft interfaces available for the MK VI and MK VIII EGPWS.

5.1 Configuration Types

The selection of the basic interfaces to the MK VI and MK VIII EGPWS can be found in the following categories:

Aircraft / Mode Type Select	Category 1
Air Data Input Select	Category 2
Position Input Select	Category 3
Altitude Callouts	Category 4
Audio Menu Select	Category 5
Terrain Display Select	Category 6
Options Select Group 1	Category 7
Radio Altitude Input Select	Category 8
Navigation Input Select	Category 9
Attitude Input Select	Category 10
Heading Input Select	Category 11
Windshear Input Select	Category 12
I / O Discretes Select	Category 13
Audio Output Level	Category 14
Future Configuration Category	Category 15
Future Configuration Category	Category 16
Future Configuration Category	Category 17

5.2 Configuration Selection

Each category provides information relative to aircraft interfaces or EGPWS functional options required or used for EGPWS operation. Each category must be defined for the specific aircraft application according to the available aircraft sensors or equipment and the intended EGPWS function. The choices provided are available in each category identified by an "ID" number. The ID number is selected for each category and is used to load the selected configuration in a configuration module installed in the aircraft wiring (physically part of one of the EGPWC mating connectors). For example, selecting Category 2, ID 1 defines the Air Data Input as ARINC 429 per Table 5.3.2-1 in Category 2. With this ID programmed into the configuration module the EGPWC will look for and use the interface defined for this ID. Table 5.2 can be used to record the selected ID for each category for later reference when programming the configuration module. This programming is accomplished using a programming software tool available from Honeywell or generating a data text string and transferring this data (in either case) via the EGPWC RS-232C (see 4.3.1) to the configuration module. Once programmed, the configuration is available and read by any installed EGPWC on power up.

Table 5.2: Category ID Selection Procedure

Step (Category)	Signal Selection	Instruction		Ident No.
1	Selects: a) Aircraft Type b) Mode Type	Using Table 5.3.1, and any sub-tables contained within, locate the Aircraft / Mode Type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
2	Selects: a) Air Data Source	Using Table 5.3.2, and any sub-tables contained within, locate the desired Air Data signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
3	Selects: a) Position Source	Using Table 5.3.3, and any sub-tables contained within, locate the desired Position signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
4	Selects: a) Altitude Callouts Menu	Using Table 5.3.4 and any sub-tables contained within, locate the desired Altitude Callout Menu.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
5	Selects: a) Audio Menu	Using Table 5.3.5 and any sub-tables contained within, locate the desired Audio Menu type. Audio Menu types 2 & 3 are designed for Fixed Gear installations.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
6	Selects: a) Terrain Display Config.	Using Table 5.3.6 and any sub-tables contained within, locate the desired Terrain Display indicator type and range bus type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
7	Selects: a) Steep Approach Enabled b) TA&D Alternate Pop Up c) Peaks Mode Enable d) Obstacle Awareness Enable e) Bank Angle Enable f) Flap Position Polarity g) GPS Altitude Reference	Using Table 5.3.7 and any sub-tables contained within, select the desired True or False condition for Steep Approach Enabled, TA&D Alternate Pop Up, Peaks Mode Enable, Obstacle Awareness Enable, Bank Angle Enable, Flap Reversal Select functions and GPS Altitude Reference type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
8	Selects: a) Radio Altitude Source	Using Table 5.3.8, and any sub-tables contained within, locate the desired Radio Altitude signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
9	Selects: a) Glideslope and/or Localizer Source	Using Table 5.3.9, and any sub-tables contained within, locate the desired Navigation signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
10	Selects: a) Attitude Source	Using Table 5.3.10, and any sub-tables contained within, locate the desired Attitude signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
11	Selects: a) Magnetic Heading Source	Using Table 5.3.11, and any sub-tables contained within, locate the desired Magnetic Heading signal type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
12	Selects: a) Windshear Input Type	Using Table 5.3.12, select “0” NoWindshear unless you are an OEM with a defined aircraft windshear type.	Record the Ident “0” (ID No.) on the space available on Ident column of this table.	0 ID #

Step (Category)	**Signal Selection**	**Instruction**		**Ident No.**
13	Selects: a) Input Discrete Functions b) Output Discrete Functions	Using Table 5.3.13, and any sub-tables contained within, locate the desired I / O Discrete type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
14	Selects: a) Audio Output Level	Using Table 5.3.14, and any sub-tables contained within, locate the desired Volume type.	Record the Ident (ID No.) on the space available on Ident column of this table.	_____ ID #
15	Selects: a) Unused	Using Table 5.3.15, select "0" Unused.	Record the Ident "0" (ID No.) on the space available on Ident column of this table.	0 ID #
16	Selects: b) Unused	Using Table 5.3.16, select "0" Unused.	Record the Ident "0" (ID No.) on the space available on Ident column of this table.	0 ID #
17	Selects: c) Unused	Using Table 5.3.17, select "0" Unused.	Record the Ident "0" (ID No.) on the space available on Ident column of this table.	0 ID #

LIMITATIONS: The described use of the configuration module provides for maximum flexibility in selection of input sensors and output behavior. Every attempt has been made to avoid conflicts arising between categories and to reflect the known configurations of aircraft. However in the case of input sensors it should not be construed that all combinations are valid configurations. There may be configurations not supported by the EGPWS software configuration building process (which will cause the EGPWS to fail in an obvious manner). In general you can not have redundancy through the mixing of analog and digital sources, however redundant digital signals on different buses are permissable. As it is not practical to verify all possible sensor combinations, verification of particular sensor combinations is part of the installation certification process. If you intend to implement a sensor configuration not currently identified in Section 5, please contact Honeywell or an authorized dealer/installer.

5.3 Configuration Selection Tables

Configuration selection is defined by category (or group of functions or inputs). The Category number identifies the subsection where the details are defined. For example Air Data, Category 2, is defined in Section 5.3.2, and Position Input Source, Category 3, is defined in Section 5.3.3.

5.3.1 Category 1, Aircraft / Mode Type Select

In this category the following parameters are defined:

- Basic mode alert thresholds
- Selected Mode 4B threshold
- Selected airspeed expansion
- Landing gear type
- Aircraft category (GA Fast, GA Slow, or Bizjet) defines the expected aircraft models, which the Aircraft Type will be allocated to. It should be noted that the term "GA" when referring to GA Fast and GA Slow refers to Turboprop aircraft and slower jet aircraft. Some of the differences between aircraft types are listed below to assist the reader.

  Bizjet (Turbofan, MK VIII EGPWS only):
  - Uses Commercial GPWS modes with Bizjet optimized "Bank-Angle" callout.
  - A Gear stuck down fault will be indicated if the Gear are down and Airspeed exceeds 290 knots
  - A Flap stuck down fault will be indicated if the Flaps are down and Airspeed exceeds 250 knots
  - Uses either a 2000 ft and greater runway database (default) or a 3500 ft and greater runway database

  GA Fast (Fast Turboprop):
  - Uses classic MK VI GPWS modes.
  - A Gear stuck down fault will be indicated if the Gear are down and Airspeed exceeds 290 knots
  - A Flap stuck down fault will be indicated if the Flaps are down and Airspeed exceeds 250 knots

  GA Slow (Slow Turboprop):
  - Uses classic MK VI GPWS modes.
  - Allows use of Mode 4 Alternate Airspeed Expansion
  - A Gear stuck down fault will be indicated if the Gear are down and Airspeed exceeds 200 knots
  - A Flap stuck down fault will be indicated if the Flaps are down and Airspeed exceeds 180 knots

The gear stuck and flap stuck faults activate the "GPWS INOP" and are recorded in fault history.

In addition, the Mode 4 Altitude and Airspeed Expansion variables are defined as follows:

- Mode 4B Altitude are described as follows:

  150' Mode 4B: The voice "Too Low Flaps" is intitiated at 150 feet above the ground.
  170' Mode 4B: The voice "Too Low Flaps" is intitiated at 170 feet above the ground.
  200' Mode 4B: The voice "Too Low Flaps" is intitiated at 200 feet above the ground.

- Normal/Alternate Airspeed Expansion are described as follows:

  Normal Airspeed Expansion:
  - Above 178 knots, penetration of the Mode 4 envelope will cause a "Too Low Terrain" voice
  - Below 178 knots, penetration of the Mode 4 envelope will cause a "Too Low Gear" voice

  Alternate Airspeed Expansion:
  - Above 148 knots, penetration of the Mode 4 envelope will cause a "Too Low Terrain" voice
  - Below 148 knots, penetration of the Mode 4 envelope will cause a "Too Low Gear" voice

The following table provides identification of the basic Aircraft/Mode Types and associated parameters. For purposes of selecting an ID, use the "Description" provided in Table 5.3.1 appropriate to the desired variables as given above.

Table 5.3.1: Aircraft / Mode Type Select

ID	Aircraft / Mode Type	DESCRIPTION	Software Effectivity	EGPWS	
				MKVI	MKVIII
0	0	GA Fast (Fast Turboprop, Slow Turbofan), 170' Mode 4B, Normal Airspeed Expansion	-020	X	X
1	1	GA Fast (Fast Turboprop, Slow Turbofan), 150' Mode 4B, Normal Airspeed Expansion	-020	X	X
2	2	GA Fast (Fast Turboprop, Slow Turbofan), 200' Mode 4B, Normal Airspeed Expansion	-020	X	X
3	3	GA Slow (Slow Turboprop), 170' Mode 4B, Alternate Airspeed Expansion	-020	X	X
4	4	GA Slow (Slow Turboprop), 150' Mode 4B, Alternate Airspeed Expansion	-020	X	X
254	254	Bizjet (Turbofan), default GPWS modes with Bizjet Bank Angle Callout and 3500 ft and greater runway database. (MKVIII Only) (Note 1)	-020	N/A	X
255	255	Bizjet (Turbofan), default GPWS modes with Bizjet Bank Angle Callout and 2000 ft and greater runway database. (MKVIII Only)	-020	N/A	X

Note 1: ID 254 is supported with terrain database 426 and later.

ID	Aircraft Type	Mode 1 Type	Mode 2 Type	Mode 3 Type	Mode 4 Type	Mode 6 Type	Bank Angle Type	Runway Database
0	GA Fast	4	4	2	6	1	4	2000'
1	GA Fast	4	4	2	8	1	4	2000'
2	GA Fast	4	4	2	5	1	4	2000'
3	GA Slow	4	5	2	7	1	4	2000'
4	GA Slow	4	5	2	9	1	4	2000'
254	Bizjet	1	1	1	1	1	2	3500'
255	Bizjet	1	1	1	1	1	2	2000'

See Product Specification 965-1180-601 for a description of Mode 'X' type number.

5.3.2 Category 2, Air Data Input Select

The following table provides identification of the Air Data source type. The entry in the Air Data Type corresponds to a table that provides detailed information on the configuration. For example, the details for Air Data Type #2 are found in Table 5.3.2-2. In this category, only the following signals are defined:

- Uncorrected Barometric Altitude in analog, ARINC 575, or ARINC 429 format, and associated validity.
- Temperature (Outside Air or Static Air) in analog, ARINC 575, or ARINC 429 format.
- Corrected Barometric Altitude in ARINC 429 format.
- Barometric Rate in ARINC 575 or ARINC 429 format.
- Computed Airspeed in ARINC 575 or ARINC 429 format.

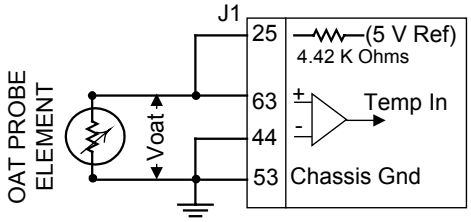
TABLE 5.3.2: AIR DATA INPUT SELECT

ID	Air Data Type (Table 5.3.2-x)	Description	Software Effectivity	EGPWS	
				MKVI	MKVIII
0	0	Analog - Uncorrected Baro altitude and 500Ω OAT (i.e., CIC 04077)	-020	X	X
1	1	Digital - ARINC 429 (i.e., Bendix KDC 281)	-020	X	X
2	2	Digital - ARINC 575 (i.e., Collins ADC-80, 81, 82)	-020	X	X
3	3	Analog - Uncorrected Baro altitude and 500Ω OAT (i.e., Collins ADS-65)	-020	X	X
4	4	Analog - Uncorrected Baro altitude and 500Ω OAT (i.e., CIC 02702)	-020	X	X
5	5	Digital - ARINC 429 with Corrected Altitude label 204 (i.e., Bendix KDC 481T)	-020	X	X
6	6	Digital - ARINC 429 without Baro Rate label 212 (i.e., Honeywell AZ-810)	-020	X	X
10	10	Digital - ARINC 429 and 500Ω OAT (i.e. Shadin 2000)	-020	X	X
11	11	Analog - Uncorrected Baro altitude and 500Ω OAT (i.e., Honeywell AZ-241, AZ-242, AZ-648, AZ-800, AZ-810) **(Note 2)**	-020	X	X
12	12	Analog - Uncorrected Baro altitude without temperature (i.e., Honeywell AZ-241, AZ-242, AZ-648, AZ-800, AZ-810) **(Note 2)**	-020	X	X
13	13	Digital - ARINC 429 Uncorrected Altitude label 203 without temperature	-020	X	X
255	255	Digital – ARINC 429 (via dual IOC buses). (**Note 1**)	-020	N/A	X

Note 1: ID 255 may only be used in conjunction with other IOC bus selections for categories 6, 8, 9, 10, 11 and 12.

Note 2: The AZ-800 provides an OAT signal with reference provided by the ADC. This signal is not compatible with any current EGPWS interface. The AZ-241 does not provide an OAT interface. The installer may either add an OAT probe (ID 11) or use the internal constant (ID 12). Honeywell recommends ID 11 (added OAT probe) be used when operating in temperature extremes.

TABLE 5.3.2-0: AIR DATA INPUT SELECT #0

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Uncorrected Barometric Altitude	(+) = J1-62 (–) = J1-43	6.1.3	Format: DC with Validity Flag Input Type: Basic Fault Designation: BAROMETRIC ALTITUDE FAULT Validity: Barometric Alt Valid (+28V)
Outside Air Temp Total Air Temperature Probe element Excitation: Temp Input (probe element): Ground	 5 V = J1-25 (+) = J1-63 (–) = J1-44 GND = J1-53	6.1.4 4.2.3.5 4.2.10	Format: DC Input Type: Basic Fault Designation: STATIC AIR TEMPERATURE FAULT  Note: Nominal 500 Ω Temperature Probe only. Resistance @ 0°C: 500Ω ± 0.6Ω Connection example: CIC Temperature Sensor, P/N 05257 (2 wire). Connect positive lead to both J1-25 and J1-63. Connect negative lead to both J1-44 and J1-53 (Chassis Ground). Other probes may have three contacts.
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
Barometric Altitude Validity Discrete (+28V)	J1-9	Input	28V_DISC_08	>+17V = Valid < +4.4V = Invalid	6.6.22 4.2.7

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Analog	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Baro Rate is not available with this air data source.

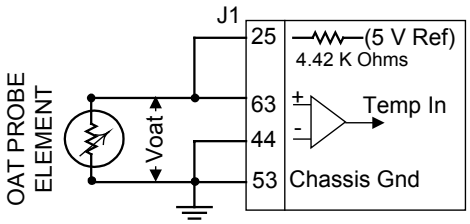
TABLE 5.3.2-1: AIR DATA INPUT SELECT #1

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 429 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39 B = J2-38	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	Barometric Rate	6.2.3	212	11	±32768 FPM	Basic	16.0	31.3-62.5
	Static Air Temperature	6.2.2	213	11	512 Degrees	Basic	0.25	250-500

TABLE 5.3.2-2: AIR DATA INPUT SELECT #2

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 575 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39	Uncorrected Baro. Alt	6.3.2	203	17	±131,072 FT	Basic	1.0	31.3-62.5
B = J2-38	Computed Airspeed	6.3.4	206	13	±1024 KTS	Basic	0.125	62.5-125
	Barometric Rate	6.3.3	212	11	±20480 FPM	Basic	10.0	31.3-62.5
	Static Air Temperature	6.3.1	213	10	±512 Degrees	Basic	0.5	250-500

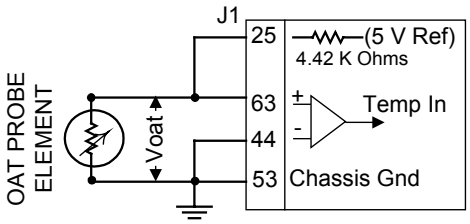
TABLE 5.3.2-3: AIR DATA INPUT SELECT #3

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Uncorrected Barometric Altitude	(+) = J1-62 (–) = J1-43	6.1.10	Format: DC with Validity Flag Input Type: Basic Fault Designation: BAROMETRIC ALTITUDE FAULT Validity: Barometric Alt Valid (+28V)
Outside Air Temp Total Air Temperature Probe element Excitation: Temp Input (probe element): Ground	 5 V = J1-25 (+) = J1-63 (–) = J1-44 GND = J1-53	6.1.4 4.2.3.5 4.2.10	Format: DC Input Type: Basic Fault Designation: STATIC AIR TEMPERATURE FAULT  Note: Nominal 500 Ω Temperature Probe only. Resistance @ 0°C: 500Ω ± 0.6Ω Connection example: CIC Temperature Sensor, P/N 05257 (2 wire). Connect positive lead to both J1-25 and J1-63. Connect negative lead to both J1-44 and J1-53 (Chassis Ground). Other probes may have three contacts.
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
Barometric Altitude Validity Discrete (+28V)	J1-9	Input	28V_DISC_08	>+17V = Valid < +4.4V = Invalid	6.6.22 4.2.7

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Analog	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Baro Rate is not available with this air data source.

TABLE 5.3.2-4: AIR DATA INPUT SELECT #4

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Uncorrected Barometric Altitude	(+) = J1-62 (–) = J1-43	6.1.13	Format: DC with Validity Flag Input Type: Basic Fault Designation: BAROMETRIC ALTITUDE FAULT Validity: Barometric Alt Valid (+28V)
Outside Air Temp Total Air Temperature Probe element Excitation: Temp Input (probe element): Ground	 5 V = J1-25 (+) = J1-63 (–) = J1-44 GND = J1-53	6.1.4 4.2.3.5 4.2.10	Format: DC Input Type: Basic Fault Designation: STATIC AIR TEMPERATURE FAULT  Note: Nominal 500 Ω Temperature Probe only. Resistance @ 0°C: 500Ω ± 0.6Ω Connection example: CIC Temperature Sensor, P/N 05257 (2 wire). Connect positive lead to both J1-25 and J1-63. Connect negative lead to both J1-44 and J1-53 (Chassis Ground). Other probes may have three contacts.
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
Barometric Altitude Validity Discrete (+28V)	J1-9	Input	28V_DISC_08	>+17V = Valid < +4.4V = Invalid	6.6.22 4.2.7

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Analog	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Baro Rate is not available with this air data source.

TABLE 5.3.2-5: AIR DATA INPUT SELECT #5

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 429 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39 B = J2-38	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
	Corrected Baro. Alt	6.2.38	204	17	±131,072 FT	Basic	1.0	31.3-62.5
	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	Barometric Rate	6.2.3	212	11	±32678 FPM	Basic	16.0	31.3-62.5
	Static Air Temperature	6.2.2	213	11	±512 Degrees	Basic	0.25	250-500

TABLE 5.3.2-6: AIR DATA INPUT SELECT #6

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 429 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
B = J2-38	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	Static Air Temperature	6.2.2	213	11	±512 Degrees	Basic	0.25	250-500

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Digital	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Baro Rate is not available with this air data source.

TABLE 5.3.2-10: AIR DATA INPUT SELECT #10

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 429 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
B = J2-38	Corrected Baro. Alt	6.2.38	204	17	±131,072 FT	Basic	1.0	31.3-62.5
	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	Barometric Rate	6.2.3	212	11	±32678 FPM	Basic	16.0	31.3-62.5

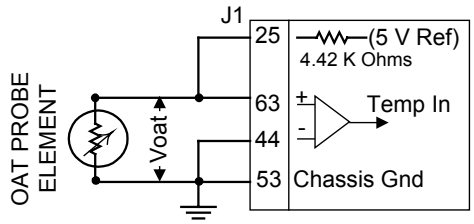
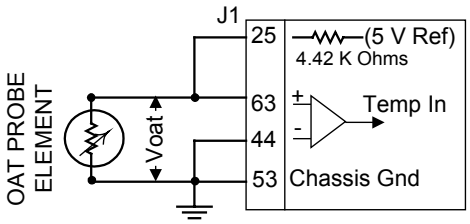
Outside Air Temp Total Air Temperature		6.1.4 4.2.3.5	Format: DC Input Type: Basic Fault Designation: STATIC AIR TEMPERATURE FAULT
Probe element Excitation:	5 V = J1-25	4.2.10	
Temp Input (probe element):	(+) = J1-63 (–) = J1-44		Note: Nominal 500 Ω Temperature Probe only. Resistance @ 0°C: 500Ω ± 0.6Ω
Ground	GND = J1-53		Connection example: CIC Temperature Sensor, P/N 05257 (2 wire). Connect positive lead to both J1-25 and J1-63. Connect negative lead to both J1-44 and J1-53 (Chassis Ground). Other probes may have three contacts.

TABLE 5.3.2-11: AIR DATA INPUT SELECT #11

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Uncorrected Barometric Altitude	(+) = J1-62 (–) = J1-43	6.1.16	Format: DC with Validity Flag Input Type: Basic Fault Designation: BAROMETRIC ALTITUDE FAULT Validity: Barometric Alt Valid (+28V)
Outside Air Temp Total Air Temperature Probe element Excitation: Temp Input (probe element): Ground	 5 V = J1-25 (+) = J1-63 (–) = J1-44 GND = J1-53	6.1.4 4.2.3.5 4.2.10	Format: DC Input Type: Basic Fault Designation: STATIC AIR TEMPERATURE FAULT  Note: Nominal 500 Ω Temperature Probe only. Resistance @ 0°C: 500Ω ± 0.6Ω Connection example: CIC Temperature Sensor, P/N 05257 (2 wire). Connect positive lead to both J1-25 and J1-63. Connect negative lead to both J1-44 and J1-53 (Chassis Ground). Other probes may have three contacts.
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
Barometric Altitude Validity Discrete (+28V)	J1-9	Input	28V_DISC_08	>+17V = Valid < +4.4V = Invalid	6.6.22 4.2.7

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Analog	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Although the ADC's provide Baro Rate, the EGPWS does not have an analog connection available.

TABLE 5.3.2-12: AIR DATA INPUT SELECT #12

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Uncorrected Barometric Altitude	(+) = J1-62 (–) = J1-43	6.1.16	Format: DC with Validity Flag Input Type: Basic Fault Designation: BAROMETRIC ALTITUDE FAULT Validity: Barometric Alt Valid (+28V)
Outside Air Temp	No Connection	N/A	No temperature
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
Barometric Altitude Validity Discrete (+28V)	J1-9	Input	28V_DISC_08	>+17V = Valid < +4.4V = Invalid	6.6.22 4.2.7

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Analog	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Although the ADC's provide Baro Rate, the EGPWS does not have an analog connection available.

TABLE 5.3.2-13: AIR DATA INPUT SELECT #13

CHANNEL 429RX_2	CONNECT TO: ADC #1 Format: ARINC 429 (Low Speed)		Fault Designation: AIR DATA BUS Bus Type: Basic					
A = J2-39 B = J2-38	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5

Outside Air Temp	No Connection	N/A	No temperature
Computed Airspeed	No Connection	N/A	Substitute Ground Speed for Airspeed (airspeed is not available with this air data input)

Configuration Data	Type	Summary Data
Derive Baro Altitude Rate	Digital	Baro Altitude Rate is derived using Uncorrected Barometric Altitude. Baro Rate is not available with this air data source.

TABLE 5.3.2-255: AIR DATA INPUT SELECT #255

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
B = J2-36	Corrected Baro. Alt	6.2.38	204	17	±131,072 FT	Basic	1.0	31.3-62.5
	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	True Airspeed	6.2.40	210	15	±2048 KTS	Basic	0.0625	62.5-125
	Barometric Rate	6.2.3	212	11	±32678 FPM	Basic	16.0	31.3-62.5
	Static Air Temperature	6.2.2	213	11	±512 Degrees	Basic	0.25	250-500
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Uncorrected Baro. Alt	6.2.1	203	17	±131,072 FT	Basic	1.0	31.3-62.5
B = J2-40	Corrected Baro. Alt	6.2.38	204	17	±131,072 FT	Basic	1.0	31.3-62.5
	Computed Airspeed	6.2.39	206	14	±1024 KTS	Basic	0.0625	62.5-125
	True Airspeed	6.2.40	210	15	±2048 KTS	Basic	0.0625	62.5-125
	Barometric Rate	6.2.3	212	11	±32678 FPM	Basic	16.0	31.3-62.5
	Static Air Temperature	6.2.2	213	11	±512 Degrees	Basic	0.25	250-500

5.3.3 Category 3, Position Input Select

The following table provides identification of the Position source signal. Each entry in the Position Input Type column has a corresponding table that provides detailed information on the configuration. For example, the details for Position Input Type #0 are found in Table 5.3.3-0.

In this category, only the following Position signals are defined:

- Altitude
- Date *
- Ground Speed
- Horizontal Figure of Merit (HFOM)
- Horizontal Integrity Limit
- Latitude Position
- Longitude Position
- Sensor Status
- True Track Angle
- Universal Time Correlation *
- Vertical Figure of Merit (VFOM)
- N/S Velocity
- E/W Velocity
- Vertical Velocity

* used if present

Table 5.3.3: Position Input Select

ID	Position Input Type (Table 5.3.3-x)	Description	Software Effectivity	EGPWS	
				MK VI	MK VIII
0	0	GPS, ARINC 429 low speed, ARINC 743A format	-020	X	X
1	1	GPS, ARINC 429 low speed, ARINC 743 format	-020	X	X
2	2	GPS, Internal	-020	X	X
3	3	GPS, RS-232 GPS-PXPRESS format	-020	X	X
4	4	GPS, ARINC 429 high speed, ARINC 743A format	-020	X	X
5	5	GPS, ARINC 429 high speed, ARINC 743 format	-020	X	X
10	10	GPS, ARINC 429 low speed, ARINC 743A format No N/S-E/W velocities **Note 2**	-020	X	X
11	11	GPS, ARINC 429 low speed, ARINC 743 format No N/S-E/W velocities **Note 2**	-020	X	X
12	12	GPS, ARINC 429 high speed, ARINC 743A format No N/S-E/W velocities **Note 2**	-020	X	X
13	13	GPS, ARINC 429 high speed, ARINC 743 format No N/S-E/W velocities **Note 2**	-020	X	X
253	253	Dual IOC GPS, ARINC 429 high speed, ARINC 743A format, No N/S-E/W velocities **Note 2**	-020	X	X
255	255	Dual GPS, ARINC 429 high speed, ARINC 743A format	-020	N/A	X

NOTE 1: The GPS Altitude Reference in Category 7, Options Select Group #1 must be properly applied for the appropriate GPS Position type. At the time of release of this document, all GPS sources except the Universal GPS1000 based systems are of MSL type. The Universal GPS1000 based GPS sources are of WGS-84 type. If the internal GPS source (ID=2) is defined, the GPS altitude reference in Category 7 must be MSL.

NOTE 2: ID 10, 11, 12, 13 and 253 may only be used when pitch and roll attitude inputs are configured for use in Category 10 Attitude Input Select.

Table 5.3.3-0: Position Input Type 0 (Low Speed ARINC 743A GPS)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743A) Format: ARINC 429 (Low Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	North/South Velocity	6.2.53	166	15	±4096 Knots	Basic	0.125	1000
	East/West Velocity	6.2.54	174	15	±4096 Knots	Basic	0.125	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-1: Position Input Type 1 (Low Speed ARINC 743 GPS)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743) Format: ARINC 429 (Low Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VDOP	6.2.15	102	15	1024	Basic	0.03125	1000
	HDOP	6.2.12	101	15	1024	Basic	0.03125	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	North/South Velocity	6.2.53	166	15	±4096 Knots	Basic	0.125	1000
	East/West Velocity	6.2.54	174	15	±4096 Knots	Basic	0.125	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-2: Position Input Type 2 (Internal GPS)

CHANNEL	Internal GPS		Fault Designation: INTERNAL GPS Bus Type: Basic					
	Data	Reference	ID/byte	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
	Latitude	6.4.1	15/1-4	32	±180 Degrees	Basic	real single-precision	1000
	Longitude	6.4.1	15/5-8	32	±180 Degrees	Basic	real single-precision	1000
	HP Error	6.4.1	15/9-12	32	meters	Basic	real single-precision	1000
	Altitude	6.4.2	16/1-4	32	meters	Basic	real single-precision	1000
	VP Error	6.4.2	16/5-8	32	meters	Basic	real single-precision	1000
	Ground Speed	6.4.3	17/1-4	32	meters/sec	Basic	real single-precision	1000
	True Track Angle	6.4.3	17/5-8	32	360 Degrees	Basic	real single-precision	1000
	East Velocity	6.4.4	18/1-4	32	meters/sec	Basic	real single-precision	1000
	North Velocity	6.4.4	18/5-8	32	meters/sec	Basic	real single-precision	1000
	Vertical Velocity	6.4.4	18/9-12	32	meters/sec	Basic	real single-precision	1000
	GPS State	6.4.5	1C/0	8	Discrete Wd	Basic	n/a	1000
	Integrity State	6.4.5	1C/1	8	Discrete Wd	Basic	n/a	1000
	Error Status	6.4.5	1C/6-7	8	Discrete Wd	Basic	n/a	1000

Notes:
* Slowest acceptable update rate in milliseconds.
1. "MSL" reference must be selected when an internal GPS is utilized. Refer to Table 5.3.7

Table 5.3.3-3: Position Input Type 3 (RS232 GPS, PXpress format)

CHANNEL GPS_RXA GPS_TXA	CONNECT TO: GPS (PXpress format) Format: RS232 (9600 baud)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	ID/byte	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
J2-28 (cm)	Latitude	6.4.1	15/1-4	32	±180 Degrees	Basic	real single-precision	1000
J2-29 (Rx)	Longitude	6.4.1	15/5-8	32	±180 Degrees	Basic	real single-precision	1000
	HP Error	6.4.1	15/9-12	32	meters	Basic	real single-precision	1000
	Altitude	6.4.2	16/1-4	32	meters	Basic	real single-precision	1000
	VP Error	6.4.2	16/5-8	32	meters	Basic	real single-precision	1000
	Ground Speed	6.4.3	17/1-4	32	meters/sec	Basic	real single-precision	1000
	True Track Angle	6.4.3	17/5-8	32	360 Degrees	Basic	real single-precision	1000
	East Velocity	6.4.4	18/1-4	32	meters/sec	Basic	real single-precision	1000
	North Velocity	6.4.4	18/5-8	32	meters/sec	Basic	real single-precision	1000
	Vertical Velocity	6.4.4	18/9-12	32	meters/sec	Basic	real single-precision	1000
	GPS State	6.4.5	1C/0	8	Discrete Wd	Basic	n/a	1000
	Integrity State	6.4.5	1C/1	8	Discrete Wd	Basic	n/a	1000
	Error Status	6.4.5	1C/6-7	8	Discrete Wd	Basic	n/a	1000

Notes:
* Slowest acceptable update rate in milliseconds.

Table 5.3.3-4: Position Input Type 4 (High Speed ARINC 743A GPS)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743A) Format: ARINC 429 (High Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	North/South Velocity	6.2.53	166	15	±4096 Knots	Basic	0.125	1000
	East/West Velocity	6.2.54	174	15	±4096 Knots	Basic	0.125	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-5: Position Input Type 5 (High Speed ARINC 743 GPS)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743) Format: ARINC 429 (High Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VDOP	6.2.15	102	15	1024	Basic	0.03125	1000
	HDOP	6.2.12	101	15	1024	Basic	0.03125	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	North/South Velocity	6.2.53	166	15	±4096 Knots	Basic	0.125	1000
	East/West Velocity	6.2.54	174	15	±4096 Knots	Basic	0.125	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-10: Position Input Type 10 (Low Speed ARINC 743A GPS, no N/S-E/W Velocities)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743A) Format: ARINC 429 (Low Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude – Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude – Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-11: Position Input Type 11 (Low Speed ARINC 743 GPS, no N/S-E/W Velocities)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743) Format: ARINC 429 (Low Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude – Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude – Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	15	1024 meters	Basic	0.125	1000
	HFOM	6.2.10	247	15	1024 meters	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-12: Position Input Type 12 (High Speed ARINC 743A GPS, no N/S-E/W Velocities)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743A) Format: ARINC 429 (High Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude – Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude – Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-13: Position Input Type 13 (High Speed ARINC 743 GPS, no N/S-E/W Velocities)

CHANNEL 429RX_4	CONNECT TO: GPS (ARINC 743) Format: ARINC 429 (High Speed)		Fault Designation: GPS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude – Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude – Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.14	136	15	1024 meters	Basic	0.03125	1000
	HFOM	6.2.11	247	15	1024 meters	Basic	0.03125	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

Notes:
* Slowest acceptable update rate in milliseconds.
** This label is not required. Data used if present

Table 5.3.3-253: Position Input Type 253 (Dual High Speed ARINC 743A GPS)

CHANNEL 429RX_1	CONNECT TO: IOC #1 (ARINC 743A-2) Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-37	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-36	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	Latitude - Fine	6.2.59	120	11	±0.000172	Basic	0.00000008381903	1000
	Longitude – Fine	6.2.60	121	11	±0.000172	Basic	0.00000008381903	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 ft	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000
CHANNEL 429RX_3	**CONNECT TO: IOC #2 (ARINC 743A-2) Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-41	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-40	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	Latitude - Fine	6.2.59	120	11	±0.000172	Basic	0.00000008381903	1000
	Longitude – Fine	6.2.60	121	11	±0.000172	Basic	0.00000008381903	1000
	Vertical Velocity	6.2.58	165	15	±32768 fpm	Basic	1	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 ft	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

*Slowest acceptable update rate in milliseconds.
**This label is not required. Data used if present

Table 5.3.3-255: Position Input Type 255 (Dual High Speed ARINC 743A GPS)

CHANNEL 429RX_4	CONNECT TO: GPS #1 (ARINC 743A) Format: ARINC 429 (High Speed)		Fault Designation: GPS BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-25	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-8	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000
CHANNEL 429RX_7	**CONNECT TO: GPS #2 (ARINC 743A) Format: ARINC 429 (High Speed)**		**Fault Designation: GPS BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	*Rate (ms)
A = J2-23	Latitude - Normal	6.2.7	110	20	±180 Degrees	Basic	0.00017166137695	1000
B = J2-6	Longitude - Normal	6.2.8	111	20	±180 Degrees	Basic	0.00017166137695	1000
	GPS Hor. Int. Limit	6.2.5	130	17	16 nm	Basic	0.00012207	1000
* NOTE	Altitude	6.2.4	076	20	±131,072 FT	Basic	0.125	1000
	VFOM	6.2.13	136	18	32768 ft	Basic	0.125	1000
	HFOM	6.2.10	247	18	16 nm	Basic	0.000061035	1000
	Ground Speed	6.2.6	112	15	±4096 Knots	Basic	0.125	1000
	True Track Angle	6.2.9	103	15	±180 Degrees	Basic	0.0054931640625	1000
	Sensor Status	6.2.16	273	19	Discrete Wd	Basic	n/a	1000
	**UTC	6.2.17	125	19	Discrete Wd	Basic	0.1 min	1000
	**Date	6.2.18	260	19	Discrete Wd	Basic	1 day	1000

*Slowest acceptable update rate in milliseconds.
**This label is not required. Data used if present
NOTE: This configuration may not be selected if an AHRS configuration is required for Attitude and Heading information (refer to Category 10 type 1 and Category 11 type 1), due to the conflict with Channel 429 RX-7.

5.3.4 Category 4, Altitude Callouts

The following table provides identification of the Altitude Callouts Menu. Each entry in the ID column corresponds to a particular menu selection. The Altitude Callouts menu ID's 0 through 12 consist of standard callouts. Selecting ID 0 – 12 will result in the callouts listed being enunciated.

Smart 500 activation is reflected by a "500" callout being spoken at the end of the selected callout menu sequence in the Long Level 1 Self-Test. In addition, the Callout menu ID number and the "Smart Callout Selected" configuration message, will both be given during level 3 Self-Test and in the RS232 Present Status display.

Table 5.3.4: Altitude Callouts

ID	MENU	Smart Callout Selected	Software Effectivity	EGPWS	
				MKVI	MK VIII
0	MINIMUMS-MINIMUMS, "Smart 500", 200, 100, 50, 40, 30, 20 ,10	True	-020	X	X
1	MINIMUMS-MINIMUMS, "Smart 500", 200	True	-020	X	X
2	MINIMUMS-MINIMUMS, "Smart 500", 100, 50, 40, 30, 20 ,10	True	-020	X	X
3	MINIMUMS-MINIMUMS, "Smart 500"	True	-020	X	X
4[1]	MINIMUMS-MINIMUMS, 200, 100, 50, 40, 30, 20 ,10	False	-020	X	X
5[1]	MINIMUMS-MINIMUMS, 200	False	-020	X	X
6[1]	MINIMUMS-MINIMUMS, 100, 50, 40, 30, 20 ,10	False	-020	X	X
7[1]	(no callouts)	False	-020	X	X
8[1]	MINIMUMS-MINIMUMS	False	-020	X	X
9	MINIMUMS-MINIMUMS, 500, 200, 100, 50, 40, 30, 20 ,10	False	-020	X	X
10	MINIMUMS-MINIMUMS, 500, 200	False	-020	X	X
11	MINIMUMS-MINIMUMS, 500, 100, 50, 40, 30, 20 ,10	False	-020	X	X
12	MINIMUMS-MINIMUMS, 500	False	-020	X	X
13	MINIMUMS, 1000, 500, 400, 300, 200, 100, 50, 40, 30, 20, 10	False	-020	X	X
14[1]	MINIMUMS-MINIMUMS, 100	False	-020	X	X
15[1]	MINIMUMS-MINIMUMS, 200, 100	False	-020	X	X
100[2]	Above Field Callout "500"	False	-020	X	X
101[2]	Above Field Callout "500 Above"	False	-020	X	X

1 Compliance with TSO-C151a requires a "500" callout. These IDs cannot be used on installations requiring compliance with TSO-C151a unless there is an alternate source of the "500" callout.

2 This ID provides Above Field Callout. Geometric altitude and runway database are used to calculate the height above field. If this ID is selected TA&D and TCF must be enabled (MK VI and MK VIII installations cannot select Category 6 ID 2).

Note: Selecting an Altitude Callout ID without a minimums callout can be accomplished by leaving the Decision Height (DH) input discrete open.

5.3.5 Category 5, Audio Menu Select

The Audio Menu Select option consists of sets of voices that are mapped to specific warning mode outputs. The Audio Menu tables list the alert/warning conditions in order of priority.

The following table provides identification of the Audio Menu Type. Each entry in the Audio Menu Type column has a corresponding table that provides detailed information on the configuration. For example, the details for Audio Menu Type 0 are found in Table 5.3.5-0.

Table 5.3.5: Audio Menu Type

ID	Audio Menu Type (Table 5.3.5-x)	Description	Software Effectivity
0	0	Basic (Caution Terrain TAD annunciation)	-020
1	1	Alternate (Terrain Ahead TAD annunciation)	-020
2	2	Basic (Caution Terrain TAD annunciation) for Fixed Gear aircraft	-020
3	3	Alternate (Terrain Ahead TAD annunciation) for Fixed Gear aircraft	-020

Table 5.3.5-0: Audio Menu Type 0 (Basic)

ALERT/WARNING CONDITION	AUDIO MENU	NOTES
MODE 7 WINDSHEAR WARNING	(SIREN) WINDSHEAR-WINDSHEAR-WINDSHEAR	6
MODE 1 PULL UP	PULL UP	1
MODE 2 PULL UP PREFACE	TERRAIN TERRAIN	1, 2
MODE 2 PULL UP	PULL UP	1
TERRAIN AWARENESS PREFACE	TERRAIN TERRAIN	1, 2
TERRAIN AWARENESS WARNING	PULL UP	1, 3
OBSTACLE AWARENESS PREFACE	OBSTACLE OBSTACLE	1, 2
OBSTACLE AWARENESS WARNING	PULL UP	1, 3
MODE 2 TERRAIN	TERRAIN	
MODE 6 MINIMUMS	SELECTED CALLOUTS	
TERRAIN AWARENESS CAUTION	CAUTION TERRAIN (PAUSE) CAUTION TERRAIN	4
OBSTACLE AWARENESS CAUTION	CAUTION OBSTACLE (PAUSE) CAUTION OBSTACLE	4
MODE 4 TOO LOW TERRAIN	TOO LOW TERRAIN	
TCF TOO LOW TERRAIN	TOO LOW TERRAIN	
MODE 6 ALTITUDE CALLOUTS	SELECTED CALLOUTS	
MODE 4 TOO LOW GEAR	TOO LOW GEAR	
MODE 4 TOO LOW FLAPS	TOO LOW FLAPS	
MODE 1 SINKRATE	SINKRATE Note: The basic warning is “SINKRATE (PAUSE) SINKRATE”. However, if the Mode 1 Pullup curve is violated only a single “Sinkrate” may occur prior to the pull up voice.	5
MODE 3 DON’T SINK	DON’T SINK (PAUSE) DON’T SINK	
MODE 5 GLIDESLOPE	GLIDESLOPE	
MODE 6 BANK ANGLE	BANK ANGLE (PAUSE) BANK ANGLE, BANK ANGLE BANK ANGLE	
MODE 7 WINDSHEAR CAUTION	(QUIET) (or CAUTION WINDSHEAR if Caution voice Enabled)	6

Note 1: These are the only voices that can interrupt.
Note 2: The preface voices will always be given prior to the warning voice.
Note 3: Voice message is continuous.
Note 4: Voice message will repeat every 10 seconds.
Note 5: Long Self-Test will only issue a single 'Sinkrate".
Note 6: The Windshear Alerts will only be given on a MK VIII EGPWS with Windshear enabled per Category 12.

Table 5.3.5-1: Audio Menu Type 1 (Alternate)

ALERT/WARNING CONDITION	AUDIO MENU	NOTES
MODE 7 WINDSHEAR WARNING	(SIREN) WINDSHEAR-WINDSHEAR-WINDSHEAR	6
MODE 1 PULL UP	PULL UP	1
MODE 2 PULL UP PREFACE	TERRAIN TERRAIN	1, 2
MODE 2 PULL UP	PULL UP	1
TERRAIN AWARENESS PREFACE	TERRAIN AHEAD	1, 2
TERRAIN AWARENESS WARNING	PULL UP	1, 3
OBSTACLE AWARENESS PREFACE	OBSTACLE AHEAD	1, 2
OBSTACLE AWARENESS WARNING	PULL UP	1, 3
MODE 2 TERRAIN	TERRAIN	
MODE 6 MINIMUMS	SELECTED CALLOUTS	
TERRAIN AWARENESS CAUTION	TERRAIN AHEAD (PAUSE) TERRAIN AHEAD	4
OBSTACLE AWARENESS CAUTION	OBSTACLE AHEAD (PAUSE) OBSTACLE AHEAD	4
MODE 4 TOO LOW TERRAIN	TOO LOW TERRAIN	
TCF TOO LOW TERRAIN	TOO LOW TERRAIN	
MODE 6 ALTITUDE CALLOUTS	SELECTED CALLOUTS	
MODE 4 TOO LOW GEAR	TOO LOW GEAR	
MODE 4 TOO LOW FLAPS	TOO LOW FLAPS	
MODE 1 SINKRATE	SINKRATE Note: The basic warning is "SINKRATE (PAUSE) SINKRATE". However, if the Mode 1 Pullup curve is violated only a single "Sinkrate" may occur prior to the pull up voice.	5
MODE 3 DON'T SINK	DON'T SINK (PAUSE) DON'T SINK	
MODE 5 GLIDESLOPE	GLIDESLOPE	
MODE 6 BANK ANGLE	BANK ANGLE (PAUSE) BANK ANGLE, BANK ANGLE BANK ANGLE (Honeywell Algorithm at low altitudes)	
MODE 7 WINDSHEAR CAUTION	(QUIET) (or CAUTION WINDSHEAR if Caution voice Enabled)	6

Note 1: These are the only voices that can interrupt.
Note 2: The preface voices will always be given prior to the warning voice.
Note 3: Voice message is continuous.
Note 4: Voice message will repeat every 10 seconds.
Note 5: Long Self-Test will only issue a single 'Sinkrate".
Note 6: The Windshear Alerts will only be given on a MK VIII EGPWS with Windshear enabled per Category 12.

Table 5.3.5-2: Audio Menu Type 2 (Basic for Fixed Gear Aircraft)

ALERT/WARNING CONDITION	AUDIO MENU	NOTES
MODE 7 WINDSHEAR WARNING	(SIREN) WINDSHEAR-WINDSHEAR-WINDSHEAR	6
MODE 1 PULL UP	PULL UP	1
MODE 2 PULL UP PREFACE	TERRAIN TERRAIN	1, 2
MODE 2 PULL UP	PULL UP	1
TERRAIN AWARENESS PREFACE	TERRAIN TERRAIN	1, 2
TERRAIN AWARENESS WARNING	PULL UP	1, 3
OBSTACLE AWARENESS PREFACE	OBSTACLE OBSTACLE	1, 2
OBSTACLE AWARENESS WARNING	PULL UP	1, 3
MODE 2 TERRAIN	TERRAIN	
MODE 6 MINIMUMS	SELECTED CALLOUTS	
TERRAIN AWARENESS CAUTION	CAUTION TERRAIN (PAUSE) CAUTION TERRAIN	4
OBSTACLE AWARENESS CAUTION	CAUTION OBSTACLE (PAUSE) CAUTION OBSTACLE	4
MODE 4 TOO LOW TERRAIN	TOO LOW TERRAIN	
TCF TOO LOW TERRAIN	TOO LOW TERRAIN	
MODE 6 ALTITUDE CALLOUTS	SELECTED CALLOUTS	
MODE 4 TOO LOW GEAR	TOO LOW FLAPS	
MODE 4 TOO LOW FLAPS	TOO LOW FLAPS	
MODE 1 SINKRATE	SINKRATE Note: The basic warning is “SINKRATE (PAUSE) SINKRATE”. However, if the Mode 1 Pullup curve is violated only a single “Sinkrate” may occur prior to the pull up voice.	5
MODE 3 DON’T SINK	DON’T SINK (PAUSE) DON’T SINK	
MODE 5 GLIDESLOPE	GLIDESLOPE	
MODE 6 BANK ANGLE	BANK ANGLE (PAUSE) BANK ANGLE, BANK ANGLE BANK ANGLE (Honeywell Algorithm at low altitudes)	
MODE 7 WINDSHEAR CAUTION	(QUIET) (or CAUTION WINDSHEAR if Caution voice Enabled)	6

Note 1: These are the only voices that can interrupt.
Note 2: The preface voices will always be given prior to the warning voice.
Note 3: Voice message is continuous.
Note 4: Voice message will repeat every 10 seconds.
Note 5: Long Self-Test will only issue a single 'Sinkrate".
Note 6: The Windshear Alerts will only be given on a MK VIII EGPWS with Windshear enabled per Category 12.

Table 5.3.5-3: Audio Menu Type 3 (Alternate for Fixed Gear Aircraft)

ALERT/WARNING CONDITION	AUDIO MENU	NOTES
MODE 7 WINDSHEAR WARNING	(SIREN) WINDSHEAR-WINDSHEAR-WINDSHEAR	6
MODE 1 PULL UP	PULL UP	1
MODE 2 PULL UP PREFACE	TERRAIN TERRAIN	1, 2
MODE 2 PULL UP	PULL UP	1
TERRAIN AWARENESS PREFACE	TERRAIN AHEAD	1, 2
TERRAIN AWARENESS WARNING	PULL UP	1, 3
OBSTACLE AWARENESS PREFACE	OBSTACLE AHEAD	1, 2
OBSTACLE AWARENESS WARNING	PULL UP	1, 3
MODE 2 TERRAIN	TERRAIN	
MODE 6 MINIMUMS	SELECTED CALLOUTS	
TERRAIN AWARENESS CAUTION	TERRAIN AHEAD (PAUSE) TERRAIN AHEAD	4
OBSTACLE AWARENESS CAUTION	OBSTACLE AHEAD (PAUSE) OBSTACLE AHEAD	4
MODE 4 TOO LOW TERRAIN	TOO LOW TERRAIN	
TCF TOO LOW TERRAIN	TOO LOW TERRAIN	
MODE 6 ALTITUDE CALLOUTS	SELECTED CALLOUTS	
MODE 4 TOO LOW GEAR	TOO LOW FLAPS	
MODE 4 TOO LOW FLAPS	TOO LOW FLAPS	
MODE 1 SINKRATE	SINKRATE Note: The basic warning is "SINKRATE (PAUSE) SINKRATE". However, if the Mode 1 Pullup curve is violated only a single "Sinkrate" may occur prior to the pull up voice.	5
MODE 3 DON'T SINK	DON'T SINK (PAUSE) DON'T SINK	
MODE 5 GLIDESLOPE	GLIDESLOPE	
MODE 6 BANK ANGLE	BANK ANGLE (PAUSE) BANK ANGLE, BANK ANGLE BANK ANGLE (Honeywell Algorithm at low altitudes)	
MODE 7 WINDSHEAR CAUTION	(QUIET) (or CAUTION WINDSHEAR if Caution voice Enabled)	6

Note 1: These are the only voices that can interrupt.
Note 2: The preface voices will always be given prior to the warning voice.
Note 3: Voice message is continuous.
Note 4: Voice message will repeat every 10 seconds.
Note 5: Long Self-Test will only issue a single 'Sinkrate".
Note 6: The Windshear Alerts will only be given on a MK VIII EGPWS with Windshear enabled per Category 12.

5.3.6 Category 6, Terrain Display Select

The following table (5.3.6) has an identification number (ID) associated with each Terrain Display configuration. Each of the ID rows has a group number for the Display *Configuration*, the *Input Control.* The *TA&D Pop Up Disable* function is defined by a Boolean. The ID groups will completely identify a particular Terrain Display Interface.

Table 5.3.6: Terrain Display Select

ID Table 5.3.6.1	Application Notes	Software Effectivity	EGPWS	
			MKVI	MKVIII
0	KC Picture Bus (KCPB) (**Note 1**)	-020	X	X
1	No Display (TAD and TCF Enabled)	-020	X	X
2	TAD / TCF Disabled	-020	X	X
3	Collins ProLine II (4x4) (**Note 2**)	-020	X	X
4	Honeywell/Bendix PPI-4A/4B with Auto Range (**Note 3**)	-020	X	X
5	Collins ProLine II (5x6) (**Note 2**)	-020	X	X
6	Collins ProLine II (5x4,5x5) (**Note 2**)	-020	X	X
7	Honeywell/Bendix IN182A/IN812A (RDR 2000, RDS 81/82)	-020	X	X
8	Honeywell/Bendix IN842A/IN862A (RDR 2100, RDS 84/86)	-020	X	X
9	Honeywell/Bendix EFIS 40/50 (non-Integrated)	-020	X	X
10	Honeywell/Bendix EFIS 40/50 (Integrated) **(Note 6, 8)**	-020	X	X
11	Collins WXI-701/711 PPI, with Auto Range	-020	X	X
12	Collins WXI-701/711 PPI, without Auto Range	-020	X	X
13	Honeywell P880/660/440, (Integrated) WXPD with SCI range	-020	X	X
14	Honeywell/Bendix PPI-4A/4B without Auto Range (**Note 3**)	-020	X	X
15	Honeywell P880/660/440, (Integrated) WXPD with SCI range, Aircraft symbol	-020	X	X
18	KC Picture Bus (KCPB) without presentation of Geometric Altitude **(Note 1)**	-020	X	X
19	KC Picture Bus (KCPB) with Digital Discrete Word **(Note 1, 9)**	-020	X	X
20	KC Picture Bus (KCPB) with Digital Discrete Word without presentation of Geometric Altitude **(Note 1, 9)**	-020	X	X
The following displays are only supported by the MK VIII				
235	Collins ProLine 4 (non-Integrated)	-020	N/A	X
236	Collins ProLine 4 (Integrated)	-020	N/A	X
237	Honeywell Primus 1000 with binary Peaks Elevations and Cyan ASCII window text	-020	N/A	X
238	Honeywell Primus 1000 with binary Peaks Elevations	-020	N/A	X
239	Collins FPI-9XX (Integrated) with binary Peaks	-020	N/A	X
240	Collins ProLine 21 (Integrated) with overlay Peaks Elevation and Partial Compass Raster patch (**Note 4**)	-020	N/A	X
241	Collins ProLine 21 (Integrated) with binary Peaks Elevation and Full Compass Raster patch (**Note 4**)	-020	N/A	X
243	Honeywell EDZ802, EDZ603, EDZ803 (non-Integrated) with dual SCI range (**Note 8**)	-020	N/A	X
244	Honeywell EDZ806 (non-Integrated) with dual SCI range (**Note 8**)	-020	N/A	X
245	Honeywell EDZ806, (Integrated) with dual SCI range	-020	N/A	X
246	Honeywell/Bendix EFIS 10 (non-Integrated) (**Note 7**)	-020	N/A	X
247	Collins FDS-255/2000 (EGPWS controls selection)	-020	N/A	X
248	Honeywell Primus 1000 (Integrated) with overlay Peaks Elevation	-020	N/A	X
249	Honeywell Primus EPIC CDS/R with overlay Peaks Elevations	-020	N/A	X
251	Honeywell Primus EPIC CDS/R with binary Peaks Elevations	-020	N/A	X
252	Honeywell SPZ8000, EDZ605/805 with ARINC 429 range	-020	N/A	X
253	Collins FDS-255/2000 (Integrated) display controls selection	-020	N/A	X

ID Table 5.3.6.1	Application Notes	Software Effectivity	EGPWS	
			MKVI	MKVIII
254	Collins ProLine 21 (Integrated) with binary Peaks Elevations and Partial Compass Raster patch (**Note 4**)	-020	N/A	X
255	Honeywell SPZ8000 (Integrated, older style) WXPD with SCI range (**Note 5**)	-020	N/A	X

Note 1: For a description of the KCPB features implemented in a particular software release, see Appendix B: KCPB Phased Implementation in the EGPWS Interface Methodology document 060-4303-000.
Note 2: Refer to Rockwell Collins Service Information Letter, EFIS 84/85/86 SIL 2-99 Dated March 16/99 or later revision, for information describing the requirements to interface an EGPWS to the Collins Pro Line II system equipped with EFIS 84/85/86 Displays and WXR-350/840/700 or TWR-850 Weather Radar systems. This SIL provides guidance on the type and use of Collins WXA-1000 video converter, required for EGPWS installations where a WXR-350 radar is installed in the aircraft.
Note 3: This configuration is applicable to RDR-4B with a mod that makes it capable of displaying blue.
Note 4: This ID may only be used in conjunction with other IOC bus selections for categories 2,8,9,10,11 and 12. ID's 240 and 254 can be selected for Pro Line 21 display configurations that provide a Partial Compass Raster patch (such as a Citation Jet). ID 241 can be selected for Pro Line 21 display configurations that provide a Full Compass Raster patch (such as a Challenger 300).
Note 5: This interface only supports the SG-810 and SG-811 SPZ-8000.
Note 6: SG-465 must have software level 01/14.
Note 7: Requires Bendix (Honeywell) 80-series radar (i.e. RDS-86)
Note 8: ID 10, 243, and 244 must have Category 7, Peaks Mode Enabled, option selected.
Note 9: KCPB Digital Discrete Word supports softkey discretes for Flap Desense, Steep Approach, Glideslope Cancel and Self Test.

In this category the following signals are configured by the ID number:

Signal Name	Signal Type	Defined By
Terrain Display Bus:	KCPB* or ARINC	Display *Configuration* Group
Range Bus:	ARINC 429 or RS-422	Display *Input Control* Group
TA&D Alternate Pop Up	Boolean	Defined directly in Table

*KCPB is also known as AlliedSignal Picture Bus (ASPB)

Table 5.3.6.1-0 KC Picture Bus

Display Configuration Group 0

Function	Value		Reference section
Display Type	KC Picture Bus (KCPB)[2]		
Sweep Type	Curtain (Vertical or Horizontal scan)		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	None (Display controls selection)		
Manual deselect	None (Display controls selection)		
Auto Range	Controlled by display response (if selected a 10 NM range will be used)		
Moving Marker	None		
Overlay Page	Controlled by display		
Display bus type	KCPB		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data		4.2.13.2 7.2

Display Input Control Group 0

CHANNEL 429_422RX_1	**CONNECT TO: KCPB-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250
CHANNEL 429RX_3	**CONNECT TO: KCPB-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 [1] B = J2-40	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x , and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the Display Input bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. KCPB (Keyed Component Picture Bus) is also known as ASPB (AlliedSignal Picture Bus)
3. Label 012 is optional. The current fault and fault history message “RANGE” for label 271 (Range) is not shown if Range Keys are requested on label 012 (Key Press/Display Mode).
4. The Display group is configured by the Display using response labels on its ARINC 429 data bus.
5. KCPB bus types use “Inop & Warning Annunciations in same Window” therefore during EGPWS Self Test the Fail lights will not remain on throughout the test.

Table 5.3.6.1-1 **No Display, TAD and TCF enabled**

No Table

Table 5.3.6.1-2 **No Display, TAD and TCF disabled**

No Table

Table 5.3.6.1-3 Collins Pro-Line II, 4x4

Display Configuration Group 6

Function	Value		Reference section
Display Type	Collins Pro-Line II (4x4) Display		
Sweep Type	Standard with +/-60 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" located on the left side of display. Peaks Elevations located on the upper left side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-4 Honeywell/Bendix PPI-4A/4B with Auto Range

Display Configuration Group 1

Function	Value		Reference section
Display Type	Bendix PPI-4A/4B (MAP-MODE)		
Sweep Type	Standard		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	Yes 10NM		
Moving Marker	No		
Overlay Page	Without Peaks: "TERR" located in the lower right corner. With Peaks: Peaks numbers located in the lower right corner.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. Bendix PPI 4B with blue water capability required for Peaks display.

Table 5.3.6.1-5 Collins ProLine II, 5x6

Display Configuration Group 2

Function	Value		Reference section
Display Type	Collins ProLine II (5x6)		
Sweep Type	Standard with +/-60 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevations located on upper left side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-6 Collins ProLine II, 5x4, 5x5

Display Configuration Group 3

Function	Value		Reference section
Display Type	Collins ProLine II (5x4, 5x5)		
Sweep Type	Standard with +/-60 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevations located on upper left side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-7 Honeywell/Bendix IN182A/IN812A (RDR 2000, RDS 81/82)

Display Configuration Group 4

Function	Value		Reference section
Display Type	Bendix IN182A/IN812A color radar display RDR 2000 and RDS 81/82 radar systems		
Sweep Type	Sweep range +/- 50 degrees		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up when the display is in the proper mode.	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime WXR is on and display is in proper Mode		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevation located on upper right side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 2

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-37	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-36	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-41 [1]	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-40	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-8 Honeywell/Bendix IN842A/IN862A (RDR 2100, RDS 84/86)

Display Configuration Group 5

Function	Value		Reference section
Display Type	Bendix IN842A/IN862A color radar display RDR 2100 and RDS 84/86 radar systems		
Sweep Type	Sweep range +/- 60 degrees		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up when display is in the proper mode.	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime WXR is on and display is in proper Mode		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevation located on upper right side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 2

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-37 B = J2-36	Mode (Display Word 1) Range (Display Word 2) Discrete Word (Vertical Profile)	6.2.26 6.2.20 6.2.27	270 271 273	Discrete Discrete Discrete	Mode, Tilt, Gain 5-320NM VP Mode, Bit 11	Basic Basic Basic	N/A N/A N/A	100 ms 100 ms 100 ms
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-41 [1] B = J2-40	Mode (Display Word 1) Range (Display Word 2) Discrete Word (Vertical Profile)	6.2.26 6.2.20 6.2.27	270 271 273	Discrete Discrete Discrete	Mode, Tilt, Gain 5-320NM VP Mode, Bit 11	Basic Basic Basic	N/A N/A N/A	100 ms 100 ms 100 ms
CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**				**Polarity/Configuration**	
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1				Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal	
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2				Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal	

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-9 Honeywell/Bendix EFIS 40/50 (Non-Integrated)

Display Configuration Group 7

Function	Value		Reference section
Display Type	Bendix EFIS 40/50 (Non-Integrated)		
Sweep Type	Sweep range +/- 60 degrees		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up when display is in the proper mode.	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime WXR is on and display is in proper Mode		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" at middle right of the display. Peaks Elevations located middle right of display.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 2

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-37	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-36	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-41 [1]	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-40	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-10 Honeywell/Bendix EFIS 40/50 (Integrated)

Display Configuration Group 8

Function	Value		Reference section
Display Type	Bendix EFIS 40/50 (Integrated)		
Sweep Type	Sweep range +/- 90 degrees		
Auto Pop Up [2]	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up on Caution or Warning.	Never Pop Up	
Peaks Mode [1]	**Category 7, Options Select Group #1**		5.3.7
	Peaks Always Enabled (See Note 1)		
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	Yes 10 NM		
Moving Marker	No		
Overlay Page	No, the display supplies a "TERR" mode annunciation.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 2

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-37	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-36	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-41 [3]	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-40	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
	Discrete Word (Vertical Profile)	6.2.27	273	Discrete	VP Mode, Bit 11	Basic	N/A	100 ms

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Peaks Elevations are transmitted digitally to the display via Label 025 on the ARINC 453 bus. They are then displayed as stroked characters on the bottom left or right of the display (depending on EFIS strapping).
2. To Pop Up the Terrain display for a Terrain Caution or Warning it is necessary for the EFIS to receive two discrete signals from the EGPWS (one to indicate that the Terrain display is selected and one to indicate that selection was due to an alert). The EFIS needs to distinguish between manual selection and alert conditions so it will know when it should autorange. Both EFIS and EGPWS start to autorange on a Caution or Warning to minimize any latency problem displaying status during an alert.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
4. Software Level 14 required for integrated display and popup.

Table 5.3.6.1-11 Collins WXI-701/711 PPI, with Auto Range

Display Configuration Group 9

Function	Value		Reference section
Display Type	Collins WXI-701/711 PPI		
Sweep Type	Fan		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	Yes 10NM		
Moving Marker	No		
Overlay Page	Without Peaks: "TERR" located at the bottom left of display. With Peaks: Peaks numbers located at the bottom left of display.		
Display bus type	ARINC 453		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [2] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Left/Right shift keys on the display are not to be used when displaying terrain.
2. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-12 Collins WXI-701/711 PPI, without Auto Range

Display Configuration Group 10

Function	Value		Reference section
Display Type	Collins WXI-701/711 PPI		
Sweep Type	Fan		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Without Peaks: "TERR" located at the bottom left of display. With Peaks: Peaks numbers located at the bottom left of display.		
Display bus type	ARINC 453		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [2] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Left/Right shift keys on the display are not to be used when displaying terrain.
2. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-13 Honeywell P880/660/440, WXPD with SCI range (Integrated)

Display Configuration Group 11

Function	Value		Reference section
Display Type	Honeywell P880/660/440 radar displays (Integrated)		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	Yes (across bottom of display)		
Overlay Page	Yes, for Peaks Elevations located at lower left of display		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
	Not supported for this display type		

Display Input Control Group 3

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1** **Format: RS-422 (12K baud)**		**Fault Designation: DISPLAY BUS 1** **Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range Word)	Reference 6.5.1.1	Label 80	Sig. Bits 4 Discrete	Range 2000NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO:**		**Fault Designation:** **Bus Type:**					
	No Connection							
CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**			**Polarity/Configuration**		
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1			Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal		

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Radar Indicator part number must end in –X1X.

Table 5.3.6.1-14 Honeywell/Bendix PPI-4A/4B without Auto Range

Display Configuration Group 12

Function	Value		Reference section
Display Type	Bendix PPI-4A/4B (MAP-MODE)		
Sweep Type	Standard		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Without Peaks: "TERR" located in the lower right corner. With Peaks: Peaks numbers located in the lower right corner.		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 1

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Display Word 2)	Reference 6.2.20	Label 271	Sig. Bits Discrete	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. Bendix PPI 4B with blue water capability required for Peaks display.

Table 5.3.6.1-15 Honeywell P880/660/440, (Integrated) WXPD with SCI range and A/C symbol

Display Configuration Group 13

Function	Value		Reference section
Display Type	Honeywell P880/660/440 radar displays (Integrated) with A/C symbol		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	Yes (across bottom of display)		
Overlay Page	Yes, for Peaks Elevations located lower left of the display		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
	Not supported for this display type		

Display Input Control Group 3

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1** **Format: RS-422 (12K baud)**		**Fault Designation: DISPLAY BUS 1** **Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range Word)	Reference 6.5.1.1	Label 80	Sig. Bits 4 Discrete	Range 2000NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO:**		**Fault Designation:** **Bus Type:**					
	No Connection							

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Radar Indicator part number must end in -X1X.
2. This display type overlays an inverted T aircraft symbol.

Table 5.3.6.1-18 KC Picture Bus without presentation of Geometric Altitude

Display Configuration Group 17

Function	Value		Reference section
Display Type	KC Picture Bus (KCPB)[2]		
Sweep Type	Curtain (Vertical or Horizontal scan)		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	None (Display controls selection)		
Manual deselect	None (Display controls selection)		
Auto Range	Controlled by display response (if selected a 10 NM range will be used)		
Moving Marker	None		
Overlay Page	Controlled by display		
Display bus type	KCPB		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data		4.2.13.2 7.2

Display Input Control Group 0

CHANNEL 429_422RX_1	**CONNECT TO: KCPB-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	*Range	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	*Key Press/Display Mode	6.2.25	012	Discrete	N/A	Basic	N/A	250
CHANNEL 429RX_3	**CONNECT TO: KCPB-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	*Range	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	*Key Press/Display Mode	6.2.25	012	Discrete	N/A	Basic	N/A	250

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x , and 7.1.4.x
429TX_2		No Connection (No Data Output)

Integration Notes:

1. When interfacing to a single display controller configuration the Display Input bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. KCPB (Keyed Component Picture Bus) is also known as ASPB (AlliedSignal Picture Bus)
3. Label 012 is optional. The current fault and fault history message “RANGE” for label 271 (Range) is not shown if Range Keys are requested on label 012 (Key Press/Display Mode).
4. The Display group is configured by the Display using response labels on its ARINC 429 data bus.
5. KCPB bus types use “Inop & Warning Annunciations in same Window” therefore during EGPWS Self Test the Fail lights will not remain on throughout the test.

Table 5.3.6.1-19 KC Picture Bus with Soft Keys

Display Configuration Group 0

Function	Value		Reference section
Display Type	KC Picture Bus (KCPB)[2]		
Sweep Type	Curtain (Vertical or Horizontal scan)		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	None (Display controls selection)		
Manual deselect	None (Display controls selection)		
Auto Range	Controlled by display response (if selected a 10 NM range will be used)		
Moving Marker	None		
Overlay Page	Controlled by display		
Display bus type	KCPB		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data		4.2.13.2 7.2

Display Input Control Group 4

CHANNEL 429_422RX_1	**CONNECT TO: KCPB-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250
	Discrete Word	6.2.55	017	Discrete	N/A	Basic	N/A	200
CHANNEL 429RX_3	**CONNECT TO: KCPB-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 [1] B = J2-40	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250
	Discrete Word	6.2.55	017	Discrete	N/A	Basic	N/A	200

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x , and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the Display Input bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. KCPB (Keyed Component Picture Bus) is also known as ASPB (AlliedSignal Picture Bus)
3. Label 012 is optional. The current fault and fault history message "RANGE" for label 271 (Range) is not shown if Range Keys are requested on label 012 (Key Press/Display Mode).
4. The Display group is configured by the Display using response labels on its ARINC 429 data bus.
5. KCPB bus types use "Inop & Warning Annunciations in same Window" therefore during EGPWS Self Test the Fail lights will not remain on throughout the test.

Table 5.3.6.1-20 KC Picture Bus without presentation of Geometric Altitude

Display Configuration Group 17

Function	Value		Reference section
Display Type	KC Picture Bus (KCPB)[2]		
Sweep Type	Curtain (Vertical or Horizontal scan)		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	None (Display controls selection)		
Manual deselect	None (Display controls selection)		
Auto Range	Controlled by display response (if selected a 10 NM range will be used)		
Moving Marker	None		
Overlay Page	Controlled by display		
Display bus type	KCPB		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data		4.2.13.2 7.2

Display Input Control Group 4

CHANNEL 429_422RX_1	**CONNECT TO: KCPB-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250
	Discrete Word	6.2.55	017	Discrete	N/A	Basic	N/A	200
CHANNEL 429RX_3	**CONNECT TO: KCPB-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: KCPB BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 [1] B = J2-40	Range[3]	6.2.35	271	11	0.5-1023.5NM	Basic	0.5	250
	Query/Continuous Response	6.2.24	011	Discrete	N/A	Basic	N/A	1000
	DSU Status Data (DSU only)	6.2.36	350	Discrete	N/A	Basic	N/A	1000
	Key Press/Display Mode[3]	6.2.25	012	Discrete	N/A	Basic	N/A	250
	Discrete Word	6.2.55	017	Discrete	N/A	Basic	N/A	200

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x , and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the Display Input bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. KCPB (Keyed Component Picture Bus) is also known as ASPB (AlliedSignal Picture Bus)
3. Label 012 is optional. The current fault and fault history message “RANGE” for label 271 (Range) is not shown if Range Keys are requested on label 012 (Key Press/Display Mode).
4. The Display group is configured by the Display using response labels on its ARINC 429 data bus. KCPB bus types use “Inop & Warning Annunciations in same Window” therefore during EGPWS Self Test the Fail lights will not remain on throughout the test.

Table 5.3.6.1-235 Collins ProLine 4 (Non-Integrated)

Display Configuration Group 2

Function	Value		Reference section
Display Type	Collins ProLine 4		
Sweep Type	Standard with +/-60 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevations located on upper left side of Terrain image.		
Display bus type	ARINC 453		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 244

CHANNEL 429_422RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Mode/Range Word)	Reference 6.2.21	Label 155	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Mode/Range Word)	Reference 6.2.21	Label 155	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50

CONN PIN #	**REFERENCE NAME**		**PIN FUNCTION**	**Polarity/Configuration**
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-236 Collins ProLine 4 (Integrated)

Display Configuration Group 241

Function	Value		Reference section
Display Type	Collins ProLine 4		
Sweep Type	Fan Mode with +/-60 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up controlled by display	Pop Up controlled by display	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enabled: False	**Peaks Enabled: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes (10 NM) controlled by display		
Moving Marker	No		
Overlay Page	Yes, "TERR" or Peaks Elevations located on upper left side of Terrain image. Peaks does not support sea level "blue water"		
Display Priority	Standard		
Display bus type	ARINC compatible format – Collins ProLine 4 (label 077)		
Terrain Mode Annunciation	Standard		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 244

CHANNEL 429_422RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Mode/Range Word)	Reference 6.2.21	Label 155	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 [1] B = J2-40	Data Range (Mode/Range Word)	Reference 6.2.21	Label 155	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50

Output 429 Bus Group 1

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.5.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.5.x

Integration Notes:
When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-237 Honeywell Primus 1000 with binary Peaks Elevations and Cyan ASCII window text **MK VIII Only**

Display Configuration Group 242

Function	Value		Reference section
Display Type	Honeywell Primus 1000 with binary Peaks Elevations		
Sweep Type	Honeywell		
Auto Pop Up [3]	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Binary Peaks Elevations	Yes - Data passed by ARINC 429, Labels 011 and 012		
Auto Range	Yes 10NM		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes, for Peaks Elevations only (located middle right side of display)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1/#2 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 248

CHANNEL 429_422RX_1	**CONNECT TO: IC600 #1 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 max 500
CHANNEL 429RX_3	**CONNECT TO: IC600 #2 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 max 500

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.6.x
429TX_2		No Connection (No Data Output)

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. Display channels 1 and 2 are multiplexed on ARINC 453 Bus 1.
3. The Terrain display will Pop-Up in response to EGPWS label 274, bit 28 (Left display) and bit 29 (right display).
4. The system has only one range for terrain display on MFD, therefore the range to use depends on the value of label 275, bit 17.
5. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
6. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
7. At the time of this printing this configuration is not supported by Primus 1000 hardware (prior to installation contact Honeywell EGPWS group for applicability).

Table 5.3.6.1-238 Honeywell Primus 1000 with binary Peaks Elevations MK VIII Only

Display Configuration Group 243

Function	Value		Reference section
Display Type	Honeywell Primus 1000 with binary Peaks Elevations		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Binary Peaks Elevations	Yes - Data passed by ARINC 429, Labels 011 and 012		
Auto Range	Yes 10NM		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes, for Peaks Elevations only (located middle right side of display)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1/#2 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2

Display Input Control Group 248

CHANNEL 429_422RX_1	**CONNECT TO: IC600 #1 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 500
CHANNEL 429RX_3	**CONNECT TO: IC600 #2 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 500

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. Display channels 1 and 2 are multiplexed on ARINC 453 Bus 1.
3. The Terrain display will Pop-Up in response to EGPWS label 274, bit 28 (Left display) and bit 29 (right display).
4. The system has only one range for terrain display on MFD, therefore the range to use depends on the value of label 275, bit 17.
5. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
6. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
7. At the time of this printing this configuration is not supported by Primus 1000 hardware (prior to installation contact Honeywell EGPWS group for applicability).

Table 5.3.6.1-239 Collins FPI-9XX (Integrated) with binary Peaks MK VIII Only

Display Configuration Group 244

Function	Value		Reference section
Display Type	Collins FPI-9xx with binary Peaks Elevations		
Sweep Type	Fan		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Binary Peaks Elevations	Yes - Data passed by ARINC 429, Labels 011 and 012		
Manual Select	Selection is controlled by display		
Manual Deselect	Deselection is controlled by display		
Auto Range	Yes (10 NM) controlled by display		
Moving Marker	No		
Overlay Page	No		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2		4.2.13.2 7.2

Display Input Control Group 253

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 1

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. The FPI-9xx, when not selected, will command the display range to 10 NM and "Pop Up" to Terrain mode if there is a Terrain alert. The range does not change if Terrain Mode is already selected when there is a Terrain Alert.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-240 Collins Pro Line 21 (Integrated) with overlay Peaks Elevations MK VIII Only

Display Configuration Group 245

Function	Value		Reference section
Display Type	Collins ProLine 21 Integrated, with overlay peaks elevations and partial compass raster patch		
Sweep Type	Fan Mode with +/- 90 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual Select	Selection is controlled by display		
Manual Deselect	Deselection is controlled by display		
Auto Range	Yes (10 NM) controlled by display		
Moving Marker	No		
Overlay Page	Yes, for Peaks Elevations only (located upper right side of display)		
Display bus type	ARINC Compatible Format – Collins ProLine 21 (label 077)		
Terrain Mode Annunciation	ProLine 21 system outputs Terrain Mode annunciation, it does not use EGPWS ASCII message.		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to Primary Flight Display/Multi Function display #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to Primary Flight Display/Multi Function display #2		4.2.13.2 7.2

Display Input Control Group 254

CHANNEL 429RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50

Output 429 Bus Group 1

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.6.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. The Terrain Display will Pop-Up in response to EGPWS label 274, bit 28 (left display) and bit 29 (right display).
3. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
4. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-241 Collins Pro Line 21 (Integrated) with binary Peaks Elevations and Full Compass Raster Patch **MK VIII Only**

Display Configuration Group 247

Function	Value		Reference section
Display Type	Collins ProLine 21 Integrated, with binary peaks elevations and full compass raster patch		
Sweep Type	Fan Mode with +/- 90 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Binary Peaks Elevations	Yes - Data passed by ARINC 429, Labels 011 and 012		
Manual Select	Selection is controlled by display		
Manual Deselect	Deselection is controlled by display		
Auto Range	Yes (10 NM) controlled by display		
Moving Marker	No		
Overlay Page	No		
Display bus type	ARINC Compatible Format – Collins ProLine 21 (label 077)		
Terrain Mode Annunciation	ProLine 21 system outputs Terrain Mode annunciation, it does not use EGPWS ASCII message.		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to Primary Flight Display/Multi Function display #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to Primary Flight Display/Multi Function display #2		4.2.13.2 7.2

Display Input Control Group 254

CHANNEL 429RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50

Output 429 Bus Group 1

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. The Terrain Display will Pop-Up in response to EGPWS label 274, bit 28 (left display) and bit 29 (right display).
3. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
4. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-243 Honeywell EDZ802, EDZ603, EDZ803 (non-Integrated) with dual SCI range **MK VIII Only**

Display Configuration Group 238

Function	Value		Reference section
Display Type	Honeywell (Non-Integrated) EDZ802, EDZ603, EDZ803		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime except when display is in GMAP or Sector Scan mode		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	Yes – a magenta underline will be alternately placed and removed under the Peaks Elevations		
Overlay Page	Yes for Peaks Elevations (located near the vertical center on the right edge of the Terrain image)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1 and MFD left channel		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2 and MFD right channel		4.2.13.2 7.2

Display Input Control Group 249

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1 Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100
CHANNEL 429RX_3	**CONNECT TO: SCI Bus 2 Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-10 B = J2-11	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The display does not use EGPWS ARINC 429 Output Bus.
2. The display color palette is not compatible with Terrain in the GMAP mode. Peaks Elevations are outside of the scan area in Sector Scan mode. Terrain will not be allowed to display in these modes.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-244 Honeywell EDZ806 (non-Integrated) with dual SCI range MK VIII Only

Display Configuration Group 239

Function	Value		Reference section
Display Type	Honeywell (Non-Integrated) EDZ806		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime except when display is in GMAP or Sector Scan mode		
Manual deselect	Anytime		
Auto Range	No		
Moving Marker	Yes – a magenta underline will be alternately placed and removed under the Peaks Elevations		
Overlay Page	Yes for Peaks Elevations (located near the vertical center on the right edge of the Terrain image)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2		4.2.13.2 7.2

Display Input Control Group 249

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1 Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100
CHANNEL 429RX_3	**CONNECT TO: SCI Bus 2 Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-10 B = J2-11	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The display does not use EGPWS ARINC 429 Output Bus.
2. The display color palette is not compatible with Terrain in the GMAP mode. Peaks Elevations are outside of the scan area in Sector Scan mode. Terrain will not be allowed to display in these modes.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-245 Honeywell SPZ8000, EDZ806, (Integrated) with dual SCI range MK VIII Only

Display Configuration Group 250

Function	Value		Reference section
Display Type	Honeywell (SPZ8000 new style) every fourth display line is blanked		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes 10NM		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes for Peaks Elevations only (located middle right of display)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1 and MFD left channel		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #1 and MFD right channel		4.2.13.2 7.2

Display Input Control Group 249

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1** **Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 1** **Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100
CHANNEL 429RX_3	**CONNECT TO: SCI Bus 2** **Format: RS-422 (12.0K baud)**		**Fault Designation: DISPLAY BUS 2** **Bus Type: Basic**					
A = J2-10 B = J2-11	Data Range (Mode/Range word) Status	Reference 6.5.1.1 6.5.1.2	Label 80 FF	Sig. Bits 4 discrete Discrete	Range 2000NM N/A	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. The 'DISPLAY BUS' fault will be present only if both MG inputs have failed.
3. The Honeywell EFIS SG & MG provide Terrain display relay control.
4. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
5. The display uses the following ARINC 429 labels from the EGPWS for annunciations. The Terrain display will annunciate: "TERR" in green or cyan (depending on the program) when the Terrain is selected and valid.
   "TERR" in amber if Terrain is selected and any of the following conditions are TRUE:
   - The EGPWS ARINC 429 output bus is missing or labels 050 and 051 are absent or unreadable for 2 seconds.
   - EGPWS ARINC label 051 bit 13 = 0 ("Terrain Display Valid" bit FALSE).
   - EGPWS ARINC label 050 bit 17 = 1 ("Terrain Inhibit" bit TRUE).
   - EGPWS ARINC labels are valid, but the range in label 050 disagrees with the range via SCI bus label 80 (label 050 bit 11-14 contain left display bus range and bits 15-18 are the right display bus range).

   The display will be blanked when the amber "TERR" is present.
   The display will Pop Up to Terrain mode as follows:

- If all the conditions indicated for the amber “TERR” above are FALSE.
- If the display is in normal MFD mode (not HSI backup, or SG backup) AND if label051 bit 11 transitions from 0 to 1 (rising edge), AND Checklist is not selected on the MFD, AND TCAS Auto Pop Up is not occurring.
- The display will change to Map mode.
- The display will energize the Terrain selection relays.
- The display will annunciate “TERR”.
- The display will change to the range indicated by the EGPWS ARINC 429 label 050.

Table 5.3.6.1-246 Honeywell/Bendix EFIS 10, EFS 86 Radar system MK VIII Only

Display Configuration Group 246

Function	Value		Reference section
Display Type	Bendix EFIS 10 (Non-Integrated)		
Sweep Type	Normal, Sweep range +/- 90 degrees		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up on Caution or Warning.[1]	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Off	Peaks On	
Manual select	Anytime[1]		
Manual deselect	Anytime[1]		
Auto Range	No		
Moving Marker	No		
Overlay Page	Yes; Without Peaks: "TERR" is located at the bottom left of the display. With Peaks: Peaks numbers are located at the bottom left of the display.		
Display bus type	ARINC 453		
TERRAIN DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
TERRAIN DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2		4.2.13.2 7.2

Display Input Control Group 246

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND 429 Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-37	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-36	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms
CHANNEL 429RX_3	**CONNECT TO: WX-IND 429 Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate
A = J2-41[2]	Mode (Display Word 1)	6.2.26	270	Discrete	Mode, Tilt, Gain	Basic	N/A	100 ms
B = J2-40	Range (Display Word 2)	6.2.20	271	Discrete	5-320NM	Basic	N/A	100 ms

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. Either Weather (WX) or Weather Test pattern must be displayed before Terrain can be viewed. The white Weather annunciation "WX" will still be present when Terrain is displayed.
2. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-247 Collins FDS 255/2000 with selection controlled by the EGPWS MK VIII Only

Display Configuration Group 252

Function	Value		Reference section
Display Type	Collins FDS 255/2000		
Sweep Type	Fan		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Anytime		
Manual deselect	Anytime		
Auto Range	No (see Integration Notes)		
Moving Marker	No		
Overlay Page	Yes for Peaks Elevations only (located on lower left of the display)		
Display bus type	ARINC 453		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2		4.2.13.2 7.2

Display Input Control Group 253

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND 429 Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND 429 Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

CONN PIN #	REFERENCE NAME		PIN FUNCTION	Polarity/Configuration
J1-32	GND_DISC_12	Reference 4.2.7 6.6.18	Display Select Discrete #1	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal
J1-31	GND_DISC_13	Reference 4.2.7 6.6.19	Display Select Discrete #2	Type 1 (Momentary) Gnd = Display Select Toggle <not> Gnd = Normal

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. When there is a Terrain Alert and the FDS 255/2000 is not currently displaying Terrain it will set its range to 10 NM and Pop Up to Terrain mode. The range does not change if Terrain mode is already selected when there is a Terrain Alert.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-248 Honeywell Primus 1000 MK VIII Only

Display Configuration Group 248

Function	Value		Reference section
Display Type	Honeywell Primus 1000		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes 10NM		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes, for Peaks Elevations only (located middle right side of the display)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 & #2 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator		4.2.13.2 7.2
	CONNECT TO:		
	Not supported for this display type		

Display Input Control Group 248

CHANNEL 429_422RX_1	**CONNECT TO: IC600 #1 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 500
CHANNEL 429RX_3	**CONNECT TO: IC600 #2 FDR Bus Format: ARINC 429 (High Speed)**		**Fault Designation: FDR BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range Discrete Word	Reference 6.2.23 6.2.28	Label 050 275	Sig. Bits Bits 11-14 Bit 17	Range 2000NM Discrete	Signal Type Basic Basic	Resolution N/A N/A	Rate (ms) 100 500

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. Display channels 1 and 2 are multiplexed on ARINC 453 bus 1.
3. The system only has one range for terrain display on MFD, therefore the range to use depends on the value of label 275, bit 17.
8. The Terrain display will Pop-Up in response to EGPWS label 274, bit 28 (Left display) and bit 29 (right display).
9. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
10. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.

Table 5.3.6.1-249 Honeywell Primus EPIC CDS/R, (Integrated) with overlay Peaks Elevations **MK VIII Only**

Display Configuration Group 249

Function	Value		Reference section
Display Type	Honeywell Primus EPIC CDS/R (**C**ontrol **D**isplay **S**ystem/**R**etrofit) with overlay Peaks elevation		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes 10NM		
Moving Marker	No		
Overlay Page	Yes, for Peaks Elevations only (located on lower right side of display)		
Display Priority	Standard		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 & #2 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Honeywell left/right interleaved picture bus to MFD and PFD		4.2.13.2 7.2
	CONNECT TO:		
	Not supported for this display type		

Display Input Control Group 250

CHANNEL 429_422RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data FWC & GP discrete word	Reference 6.2.48	Label 171	Sig. Bits Format 1 Bits 15-18 Bits 25-28	Range Type 1 2000NM Discrete	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data FWC & GP discrete word	Reference 6.2.48	Label 171	Sig. Bits Format 1 Bits 15-18 Bits 25-28	Range Type 1 2000NM Discrete	Signal Type Basic	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
2. The 'IOC BUS' fault will be present only if both MG inputs have failed.
3. The Honeywell EFIS SG & MG provide Terrain display relay control.
4. The EGPWS ARINC 429 Output Bus must be connected to the display
5. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
6. Display channels 1 and 2 are multiplexed on ARINC 453 bus 1.
7. This display uses the following ARINC 429 labels from the EGPWS for annunciations:
   Label 050 If bits 11-14 left range output from the EGPWS does not match left MFD range (via label 171), then display white "RANGE MISMATCH" on the left PFD and MFD.

If bits 15-18 right range output from the EGPWS does not match right MFD range (via label 171), then display white "RANGE MISMATCH" on the right PFD and MFD.

Label 051 If bit 17 = 1 then display white "TERRAIN OFF" message on PFD and MFD.

Labels 052-055 EGPWS ASCII characters are not used. Green "TERRAIN" on PFD and MFD by EFIS.

Label 274 If bit 13 or 22 = 1 then display red "PULL UP" on left and right PFD.
If bit 12 or 23 = 1 then display amber "GND PROX" on left and right PFD.
If bit 14 = 1 then display white "GPWS FAIL" message on PFD.
If bit 15 = 1 then display red "WIND SHR" message on PFD.
If bit 17 = 1 then display white WNDSHR FAIL" message on PFD.
If bit 18 = 1 then display amber "WIND SHR" message on PFD.
If bit 24 = 1 then display amber "TERRAIN FAIL" message on PFD and MFD.
If bit 27 = 1 then display amber "TERRAIN NA" message on PFD and MFD.
If bit 28 = 1 and display configured for Pop Up on pilots side, then Pop Up Terrain on left MFD.
If bit 29 = 1 and display configured for Pop Up on copilots side, then Pop Up Terrain on right MFD.
If bit 14, bit 17, and bit 24 = 1 then display amber "EGPWS SYS FAIL" on PFD in lieu of "GPWS FAIL" and "WNDSHR FAIL" messages on PFD.
If bits 30 and 31 = 01 (Functional Test) then display white "TERRAIN TEST" on PFD and MFD.

8. Terrain can be displayed on the PFD and MFD.

Table 5.3.6.1-251 Honeywell Primus EPIC CDS/R, with binary Peaks Elevations MK VIII Only

Display Configuration Group 251

Function	Value		Reference section
Display Type	Honeywell Integrated Primus Epic CDS/R (**C**ontrol **D**isplay **S**ystem/**R**etrofit), with binary peaks elevations		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Binary Peaks Elevations	Yes - Data passed by ARINC 429, Labels 011 and 012		
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes 10NM		
Moving Marker	No		
Overlay Page	No		
Display Priority	Standard		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 & #2 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Honeywell left/right interleaved picture bus to MFD and PFD		4.2.13.2 7.2
	CONNECT TO:		
	Not supported for this display type		

Display Input Control Group 250

CHANNEL 429_422RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data FWC & GP discrete word	Reference 6.2.48	Label 171	Sig. Bits Format 1 Bits 15-18 Bits 25-28	Range Type 1 2000NM Discrete	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data FWC & GP discrete word	Reference 6.2.48	Label 171	Sig. Bits Format 1 Bits 15-18 Bits 25-28	Range Type 1 2000NM Discrete	Signal Type Basic	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x, and 7.1.6.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x, and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. Display channels 1 and 2 are multiplexed on ARINC 453 Bus 1.
3. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.
4. This display uses the following ARINC 429 labels from the EGPWS for annunciation's:
   - Label 011/012 Upper/Lower Peaks Elevations – "xxx/xxx" on PFD and MFD.
   - Label 050 If bits 11-14 left range output from EGPWS does not match left MFD range (via label 171), then display white "RANGE MISMATCH" on left PFD and MFD.

	If bits 15-18 right range output from EGPWS does not match right MFD range (via label 171), then display white "RANGE MISMATCH" on right PFD and MFD.
Label 051	If Bit 17 = 1 then display white "TERRAIN OFF" message on PFD and MFD and Terrain window will be cleared by EPIC.
Labels 052-055	EGPWS ASCII characters are not used. Green TERRAIN on PFD and MFD by EFIS.
Label 274	If Bit 13 or 22 =1 then display red "PULL UP" on left and right PFD. If Bit 12 or 23 =1 then display amber "GND PROX" on left and right PFD. If Bit 14 = 1 then display white "GPWS FAIL" message on PFD. If Bit 15 = 1 then display red "WIND SHR" message on PFD. If Bit 17 = 1 then display white "WNDSHR FAIL" message on PFD. If Bit 18 = 1 then display amber "WIND SHR" message on PFD. If Bit 24 = 1 then display amber "TERRAIN FAIL" message on PFD and MFD (Terrain window cleared by Epic). If Bit 27 = 1 then display amber "TERRAIN NA" message on PFD and MFD (Terrain window cleared by Epic). If Bit 28 = 1 and display configured for pop up on Pilots side, then Pop Up Terrain on left MFD. If Bit 29 = 1 and display configured for pop up on CoPilots side, then Pop Up Terrain on right MFD. If Bit 14, Bit 17, and Bit 24 = 1 then display amber "EGPWS SYS FAIL" on PFD in lieu of "GPWS FAIL" and "WNDSHR FAIL" messages on the PFD. If bits 30 and 31 = 01 (functional test) then display white "TERRAIN TEST" on PFD and MFD.

Table 5.3.6.1-252 Honeywell SPZ8000, EDZ605, EDZ805 and EDZ806, with ARINC 429 Range **MK VIII Only**

Display Configuration Group 250

Function	Value		Reference section
Display Type	Honeywell (SPZ8000 new style) dual ARINC 429 Range		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes 10NM		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes for Peaks Elevations only (located middle right side of display)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1 and MFD left channel		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #1 and MFD right channel		4.2.13.2 7.2

Display Input Control Group 252

CHANNEL 429_422RX_1	**CONNECT TO: MG/SG Left Bus** **Format: ARINC 429 (Low Speed)**		**Fault Designation: EFIS BUS 1** **Bus Type: Basic** **Note:** Provides range unless MG is not backing up right side (see channel 3)					
A = J2-37 B = J2-36	Data Range (Both ranges on one word)	Reference 6.2.23	Label 050	Sig. Bits 4/4	Range 2000NM discrete	Signal Type TA&D	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: MG/SG Right Bus** **Format: ARINC 429 (Low Speed)**		**Fault Designation: EFIS BUS 2** **Bus Type: Basic** **Note:** Only provides range if MG is backing up right side, MG input on channel 1 is primary input					
A = J2-41 B = J2-40	Data Range (Both ranges on one word)	Reference 6.2.23	Label 050	Sig. Bits 4/4	Range 2000NM discrete	Signal Type TA&D	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. The 'EFIS BUS' fault will be present only if both MG inputs have failed.
3. The Honeywell EFIS SG & MG provide Terrain display relay control.
4. The display uses the following ARINC 429 labels from the EGPWS for annunciations. The Terrain display will annunciate: "TERR" in green or cyan (depending on the program) when the Terrain is selected and valid.
   "TERR" in amber if Terrain is selected and any of the following conditions are TRUE:
   - The EGPWS ARINC 429 output bus is missing or labels 050 and 051, or are absent or unreadable for 2 seconds.
   - EGPWS ARINC label 051 bit 13 = 0 ("Terrain Display Valid" bit FALSE).
   - EGPWS ARINC label 050 bit 17 = 1 ("Terrain Inhibit" bit TRUE).
   - EGPWS ARINC labels are valid, but the range in label 050 disagrees with the range via SCI bus label 80 (label 050 bit 11-14 contain left display bus range and bits 15-18 are the right display bus range).

The display will be blanked when the amber “TERR” is present.
The display will Pop Up to Terrain mode as follows:

- If all the conditions indicated for the amber “TERR” above are FALSE.
- If the display is in normal MFD mode (not HSI backup, or SG backup) AND if label 051 bit 11 transitions from 0 to 1 (rising edge), AND Checklist is not selected on the MFD, AND TCAS Auto Pop Up is not occurring.
- The display will change to Map mode.
- The display will energize the Terrain selection relays.
- The display will annunciate “TERR”.
- The display will change to the range indicated by the EGPWS ARINC 429 label 050.

Table 5.3.6.1-253 Collins FDS 255/2000 with selection controlled by the display MK VIII Only

Display Configuration Group 253

Function	Value		Reference section
Display Type	Collins FDS 255/2000		
Sweep Type	Fan		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection controlled by display		
Manual deselect	Deselection controlled by display		
Auto Range	No (see Integration Notes)		
Moving Marker	No		
Overlay Page	Yes for Peaks Elevations only (located on lower left of the display)		
Display bus type	Standard		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2		4.2.13.2 7.2

Display Input Control Group 253

CHANNEL 429_422RX_1	**CONNECT TO: WX-IND 429 Bus 1 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100
CHANNEL 429RX_3	**CONNECT TO: WX-IND 429 Bus 2 out Format: ARINC 429 (Low Speed)**		**Fault Designation: DISPLAY BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range	Reference 6.2.20	Label 273	Sig. Bits N/A	Range 5-320NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. When there is a Terrain Alert and the FDS 255/2000 is not currently displaying Terrain it will set its range to 10 NM and Pop Up to Terrain mode. The range does not change if Terrain mode is already selected when there is a Terrain Alert.
3. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.

Table 5.3.6.1-254 Collins ProLine 21 (Integrated) MK VIII Only

Display Configuration Group 254

Function	Value		Reference section
Display Type	Collins ProLine 21, Integrated with binary peaks elevation, with partial compass raster patch		
Sweep Type	Fan Mode with +/- 90 degree limit		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Category 7 does not affect pop up logic. The display controls pop up, therefore enable/disable of pop up is done via the display.		
Peaks Mode	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes (10NM) – Controlled by ProLine 21 system		
Moving Marker	No		
Overlay Page	No		
Display bus type	ARINC compatible format – Collins ProLine 21 (label 077)		
Terrain Mode Annunciation	ProLine 21 system outputs Terrain Mode annunciation, it does not use EGPWS ASCII message.		
DISPLAY BUS #1 453TX_1	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to Primary Flight Display/Multi Function Display #1		4.2.13.2 7.2
DISPLAY BUS #2 453TX_2	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to Primary Flight Display/Multi Function Display #2		4.2.13.2 7.2

Display Input Control Group 254

CHANNEL 429RX_1	**CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
A = J2-37 B = J2-36	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
A = J2-41 B = J2-40	Data Range (Mode/Range Word)	Reference 6.2.21	Label 176	Sig. Bits Discrete	Range 5-640NM	Signal Type Basic	Resolution N/A	Rate (ms) 50

Output 429 Bus Group 1

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x
429TX_2 (Low Speed)	A = J2-26 B = J2-9	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, 7.1.4.x, 7.1.5.x and 7.1.6.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the display.
2. When interfacing to a single display controller configuration the bus must be connected to both EGPWS input channels. This prevents the EGPWS from reporting an external bus fault on the second channel.
3. The Peaks mode will support 'blue water' on displays that can support blue.
4. This configuration will cause the GPWS INOP, TERRAIN INOP, and WINDSHEAR INOP lamps to turn on only at the beginning of the EGPWS Self Test.

Table 5.3.6.1-255 Honeywell SPZ8000 older style MK VIII Only

Display Configuration Group 255

Function	Value		Reference section
Display Type	Honeywell (5x6) SPZ8000 older style; does not blank every fourth weather radar display line. **This interface supports SG-810 and SG-811 SPZ8000 systems only.**		
Sweep Type	Honeywell		
Auto Pop Up	**Category 7, Options Select Group #1**		5.3.7
	TA&D Alternate Pop Up: False	**TA&D Alternate Pop Up: True**	
	Pop Up On Caution or Warning	Never Pop Up	
Peaks Mode (Elevations via overlay)	**Category 7, Options Select Group #1**		5.3.7
	Peaks Enable: False	**Peaks Enable: True**	
	Peaks Off	Peaks On	
Manual select	Selection is controlled by display		
Manual deselect	Deselection is controlled by display		
Auto Range	Yes (10 NM)		
Moving Marker	Yes (Honeywell type)		
Overlay Page	Yes for Peaks Elevations only (located on lower right side)		
Display bus type	Honeywell picture bus		
DISPLAY BUS #1 **453TX_1**	**CONNECT TO:**		
A = J1-58 B = J1-59	Terrain Display data to switching relay/Symbol Generator #1		4.2.13.2 7.2
DISPLAY BUS #2 **453TX_2**	**CONNECT TO:**		
A = J1-56 B = J1-57	Terrain Display data to switching relay/Symbol Generator #2 **Note:** Range setting always follows Display Bus #1		4.2.13.2 7.2

Display Input Control Group 255

CHANNEL 429_422RX_1	**CONNECT TO: SCI Bus 1 Format: RS-422 (12K baud)**		**Fault Designation: DISPLAY BUS 1 Bus Type: Basic**					
A = J2-36 B = J2-37	Data Range (Mode/Range Word)	Reference 6.5.1.1	Label 80	Sig. Bits 4 discrete	Range 2000NM	Signal Type Basic	Resolution N/A	Rate (ms) 100

Output 429 Bus Group 0

Channel	Pins	Comments
429TX_1 (Low Speed)	A = J2-43 B = J2-42	Transmits (Section 7) Label sets: 7.1.1.x, 7.1.2.x, 7.1.3.x, and 7.1.4.x

Integration Notes:

1. The EGPWS ARINC 429 Output Bus must be connected to the SPZ8000 display.

5.3.7 Category 7, Options Select Group #1

The following table provides identification of the Options Select Group #1. Each entry in the ID column corresponds to a particular combination of TA&D Alternate Pop Up, Obstacle Awareness Enabled, Peaks Mode Enabled, Bank Angle Enable, Steep Approach Enabled, Flap Reversal and GPS Altitude Reference selection. Refer to section 7.5 for configuration messages that will be present for each option selected.

Table 5.3.7: Options Select Group #1

ID	Steep Approach Enabled [1]	TA&D Alternate Pop Up	Peaks Mode Enabled [2]	Obstacle Awareness Enabled	Bank Angle Enable	Flap Reversal	GPS Altitude Reference [3]	Software Effectivity
0	False	False	False	False	False	False	WGS-84	-020
1	False	False	False	False	False	False	MSL	-020
2	False	False	False	False	False	True	WGS-84	-020
3	False	False	False	False	False	True	MSL	-020
4	False	False	False	False	True	False	WGS-84	-020
5	False	False	False	False	True	False	MSL	-020
6	False	False	False	False	True	True	WGS-84	-020
7	False	False	False	False	True	True	MSL	-020
8	False	False	False	True	False	False	WGS-84	-020
9	False	False	False	True	False	False	MSL	-020
10	False	False	False	True	False	True	WGS-84	-020
11	False	False	False	True	False	True	MSL	-020
12	False	False	False	True	True	False	WGS-84	-020
13	False	False	False	True	True	False	MSL	-020
14	False	False	False	True	True	True	WGS-84	-020
15	False	False	False	True	True	True	MSL	-020
16	False	False	True	False	False	False	WGS-84	-020
17	False	False	True	False	False	False	MSL	-020
18	False	False	True	False	False	True	WGS-84	-020
19	False	False	True	False	False	True	MSL	-020
20	False	False	True	False	True	False	WGS-84	-020
21	False	False	True	False	True	False	MSL	-020
22	False	False	True	False	True	True	WGS-84	-020
23	False	False	True	False	True	True	MSL	-020
24	False	False	True	True	False	False	WGS-84	-020
25	False	False	True	True	False	False	MSL	-020
26	False	False	True	True	False	True	WGS-84	-020
27	False	False	True	True	False	True	MSL	-020
28	False	False	True	True	True	False	WGS-84	-020
29	False	False	True	True	True	False	MSL	-020
30	False	False	True	True	True	True	WGS-84	-020
31	False	False	True	True	True	True	MSL	-020
32	False	True	False	False	False	False	WGS-84	-020
33	False	True	False	False	False	False	MSL	-020
34	False	True	False	False	False	True	WGS-84	-020
35	False	True	False	False	False	True	MSL	-020

[1] TRUE enables steep approach selection via Steep Approach Select Discrete (see Section 5.3.13 and 6.6.25).
[2] Enables PEAKS mode display if display supports (see display configuration group Section 5.3.6)
[3] "MSL" reference must be selected when an internal GPS is utilized (Refer to Table 5.3.3-2).

ID	Steep Approach Enabled [1]	TA&D Alternate Pop Up	Peaks Mode Enabled [2]	Obstacle Awareness Enabled	Bank Angle Enable	Flap Reversal	GPS Altitude Reference [3]	Software Effectivity
36	False	True	False	False	True	False	WGS-84	-020
37	False	True	False	False	True	False	MSL	-020
38	False	True	False	False	True	True	WGS-84	-020
39	False	True	False	False	True	True	MSL	-020
40	False	True	False	True	False	False	WGS-84	-020
41	False	True	False	True	False	False	MSL	-020
42	False	True	False	True	False	True	WGS-84	-020
43	False	True	False	True	False	True	MSL	-020
44	False	True	False	True	True	False	WGS-84	-020
45	False	True	False	True	True	False	MSL	-020
46	False	True	False	True	True	True	WGS-84	-020
47	False	True	False	True	True	True	MSL	-020
48	False	True	True	False	False	False	WGS-84	-020
49	False	True	True	False	False	False	MSL	-020
50	False	True	True	False	False	True	WGS-84	-020
51	False	True	True	False	False	True	MSL	-020
52	False	True	True	False	True	False	WGS-84	-020
53	False	True	True	False	True	False	MSL	-020
54	False	True	True	False	True	True	WGS-84	-020
55	False	True	True	False	True	True	MSL	-020
56	False	True	True	True	False	False	WGS-84	-020
57	False	True	True	True	False	False	MSL	-020
58	False	True	True	True	False	True	WGS-84	-020
59	False	True	True	True	False	True	MSL	-020
60	False	True	True	True	True	False	WGS-84	-020
61	False	True	True	True	True	False	MSL	-020
62	False	True	True	True	True	True	WGS-84	-020
63	False	True	True	True	True	True	MSL	-020
64	True	False	False	False	False	False	WGS-84	-020
65	True	False	False	False	False	False	MSL	-020
66	True	False	False	False	False	True	WGS-84	-020
67	True	False	False	False	False	True	MSL	-020
68	True	False	False	False	True	False	WGS-84	-020
69	True	False	False	False	True	False	MSL	-020
70	True	False	False	False	True	True	WGS-84	-020
71	True	False	False	False	True	True	MSL	-020
72	True	False	False	True	False	False	WGS-84	-020
73	True	False	False	True	False	False	MSL	-020
74	True	False	False	True	False	True	WGS-84	-020
75	True	False	False	True	False	True	MSL	-020
76	True	False	False	True	True	False	WGS-84	-020
77	True	False	False	True	True	False	MSL	-020
78	True	False	False	True	True	True	WGS-84	-020
79	True	False	False	True	True	True	MSL	-020
80	True	False	True	False	False	False	WGS-84	-020
81	True	False	True	False	False	False	MSL	-020
82	True	False	True	False	False	True	WGS-84	-020
83	True	False	True	False	False	True	MSL	-020
84	True	False	True	False	True	False	WGS-84	-020
85	True	False	True	False	True	False	MSL	-020

ID	Steep Approach Enabled [1]	TA&D Alternate Pop Up	Peaks Mode Enabled [2]	Obstacle Awareness Enabled	Bank Angle Enable	Flap Reversal	GPS Altitude Reference [3]	Software Effectivity
86	True	False	True	False	True	True	WGS-84	-020
87	True	False	True	False	True	True	MSL	-020
88	True	False	True	True	False	False	WGS-84	-020
89	True	False	True	True	False	False	MSL	-020
90	True	False	True	True	False	True	WGS-84	-020
91	True	False	True	True	False	True	MSL	-020
92	True	False	True	True	True	False	WGS-84	-020
93	True	False	True	True	True	False	MSL	-020
94	True	False	True	True	True	True	WGS-84	-020
95	True	False	True	True	True	True	MSL	-020
96	True	True	False	False	False	False	WGS-84	-020
97	True	True	False	False	False	False	MSL	-020
98	True	True	False	False	False	True	WGS-84	-020
99	True	True	False	False	False	True	MSL	-020
100	True	True	False	False	True	False	WGS-84	-020
101	True	True	False	False	True	False	MSL	-020
102	True	True	False	False	True	True	WGS-84	-020
103	True	True	False	False	True	True	MSL	-020
104	True	True	False	True	False	False	WGS-84	-020
105	True	True	False	True	False	False	MSL	-020
106	True	True	False	True	False	True	WGS-84	-020
107	True	True	False	True	False	True	MSL	-020
108	True	True	False	True	True	False	WGS-84	-020
109	True	True	False	True	True	False	MSL	-020
110	True	True	False	True	True	True	WGS-84	-020
111	True	True	False	True	True	True	MSL	-020
112	True	True	True	False	False	False	WGS-84	-020
113	True	True	True	False	False	False	MSL	-020
114	True	True	True	False	False	True	WGS-84	-020
115	True	True	True	False	False	True	MSL	-020
116	True	True	True	False	True	False	WGS-84	-020
117	True	True	True	False	True	False	MSL	-020
118	True	True	True	False	True	True	WGS-84	-020
119	True	True	True	False	True	True	MSL	-020
120	True	True	True	True	False	False	WGS-84	-020
121	True	True	True	True	False	False	MSL	-020
122	True	True	True	True	False	True	WGS-84	-020
123	True	True	True	True	False	True	MSL	-020
124	True	True	True	True	True	False	WGS-84	-020
125	True	True	True	True	True	False	MSL	-020
126	True	True	True	True	True	True	WGS-84	-020
127	True	True	True	True	True	True	MSL	-020

5.3.8 Category 8, Radio Altitude Input Select

The following table provides identification of the Radio Altitude type. The entry in the Radio Altitude Type corresponds to a table that provides detailed information on the configuration. For example, the details for Radio Altitude Type #1 are found in Table 5.3.8-1. ARINC 552, ALT 55 and digital ARINC 429 compatible Radio Altimeters are supported. ALT50 Radio Altimeters are not recommended due to the maximum 2000-foot operation. GPWS TSO-C92c requires Mode 1 alert thresholds up to 2450 feet radio altitude.

In this category, only the following signals are defined:

- Radio Altitude source selection, input scaling, and associated validities.

Table 5.3.8: Radio Altitude Input Select

ID	Radio Altitude Type (Table 5.3.8-x)	Description	Software Effectivity	EGPWS Effectivity	
				MKVI	MKVIII
0	0	Analog Radio Altitude (ARINC 552)	-020	X	X
1	1	Analog Radio Altitude (ALT 55)	-020	X	X
2	2	Digital Radio Altitude (ARINC 429)	-020	X	X
3	3	Analog Radio Altitude (RT-200/300)	-020	X	X
4	4	Analog Radio Altitude (KRA 405)	-020	X	X
251	251	Digital Radio Altitude (ARINC 429 via dual IOC buses with DH/MDA) (Note 1,3)	-020	N/A	X
252	252	Digital Radio Altitude (ARINC 429 via dual IOC buses) (Note 1,3)	-020	N/A	X
253	253	Digital Radio Altitude (ARINC 429 via dual IOC buses with DH discrete) (Note 1)	-020	N/A	X
254	254	Digital Radio Altitude and MDA (ARINC 429 via dual IOC buses) (Notes 1, 2, 3)	-020	N/A	X
255	255	Digital Radio Altitude (ARINC 429 via dual IOC buses) (Note 1, 3)	-020	N/A	X

Note 1: ID 251 - 255 may only be used in conjunction with other IOC bus selections for categories 2,6,9,10,11 and 12.
Note 2: ID 254 must be used in conjunction with Category 9 ID 254, since this provides Label 163 which determines from bits 19-21 whether MDA or DH is displayed.
Note 3: ID 251, 252, 254 and 255 must not be used in conjunction with Category 4, ID 100 or 101 Altitude Callouts types.

Table 5.3.8-0: Radio Altitude Input Select Type 0 (ARINC 552)

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Radio Altimeter #1	(+) = J1-64 (-) = J1-45	6.1.1 4.2.3.1	Format: ARINC 552 with Validity Flag Input Type: Basic Fault Designation: RADIO ALTIMETER FAULT Validity: Radio Altitude Valid Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**References**
Radio Altitude Validity Discrete #1 (+28V)	J1-29	Input	28V_DISC_07	>+17V = Valid <+4.4V = Invalid	6.6.1 4.2.7
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11	Gnd = Below DH <not> Gnd = Above DH	6.6.14 4.2.7

Table 5.3.8-1: Radio Altitude Input Select Type 1 (ALT 55)

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Radio Altimeter #1	(+) = J1-64 (-) = J1-45	6.1.2 4.2.3.1	Format: Alt 55 with Validity Flag Input Type: Basic Fault Designation: RADIO ALTIMETER FAULT Validity: Radio Altitude Valid Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**References**
Radio Altitude Validity Discrete #1 (+28V)	J1-29	Input	28V_DISC_07	>+17V = Valid <+4.4V = Invalid	6.6.1 4.2.7
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11	Gnd = Below DH <not> Gnd = Above DH	6.6.14 4.2.7

Table 5.3.8-2: Radio Altitude Input Select Type 2 (ARINC 429)

CHANNEL 429RX_5	CONNECT TO: Left LRRA Format: ARINC 429 (Low Speed)		Fault Designation: RADIO ALTIMETER BUS Bus Type: Basic					
A = J2-21 B = J2-4	Data Radio Altitude	Reference 6.2.29	Label 164	Sig. Bits 16	Range ±8192 FT	Signal Type Basic	Resolution 0.125	Rate (ms) 25-50
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**			**Polarity/Configuration**		**References**
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11			Gnd = Below DH <not> Gnd = Above DH		6.6.14 4.2.7

Table 5.3.8-3: Radio Altitude Input Select Type 3 (RT-200/300)

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Radio Altimeter #1	(+) = J1-64 (-) = J1-45	6.1.11 4.2.3.1	Format: DC with Validity Flag (RT-200/300 Precision Output) Input Type: Basic Fault Designation: RADIO ALTIMETER FAULT Validity: Radio Altitude Valid Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**References**
Radio Altitude Validity Discrete #1 (+28V)	J1-29	Input	28V_DISC_07	>+17V = Valid <+4.4V = Invalid	6.6.1 4.2.7
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11	Gnd = Below DH <not> Gnd = Above DH	6.6.14 4.2.7

Table 5.3.8-4: Radio Altitude Input Select Type 4 (KRA 405)

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Radio Altimeter #1	(+) = J1-64 (-) = J1-45	6.1.2 4.2.3.1	Format: Alt 55 with Validity Flag (KRA-405 Auxiliary Output #1) Input Type: Basic Fault Designation: RADIO ALTIMETER FAULT Validity: Radio Altitude Valid Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**References**
Radio Altitude Validity Discrete #1 (+28V)	J1-29	Input	28V_DISC_07	>+17V = Valid <+4.4V = Invalid	6.6.1 4.2.7
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11	Gnd = Below DH <not> Gnd = Above DH	6.6.14 4.2.7

Table 5.3.8-251: Radio Altitude Input Select Type 251 (ARINC 429 via dual IOC buses with DH/MDA)

CHANNEL 429RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-36	Decision Height/MDA	6.2.62	170	12 / 14	4096/16384	Basic	1.0	1000
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-40	Decision Height/MDA	6.2.62	170	12 / 14	4096/16384	Basic	1.0	1000

Table 5.3.8-252: Radio Altitude Input Select Type 252 (ARINC 429 via dual IOC buses with DH discrete)

CHANNEL 429RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-36	Decision Height (format 1)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-40	Decision Height (format 1)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200

Table 5.3.8-253: Radio Altitude Input Select Type 253 (ARINC 429 via dual IOC buses with DH discrete)

CHANNEL 429RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50

PIN FUNCTION	CONNECTION	PIN TYPE	CHANNEL DESIGNATION REFERENCE	Polarity/Configuration	References
DH Discrete (Gnd)	J1-33	Input	GND_DISC_11	Gnd = Below DH <not> Gnd = Above DH	6.6.14 4.2.7

Table 5.3.8-254: Radio Altitude Input Select Type 254 (ARINC 429 via dual IOC buses)

CHANNEL 429RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-36	Decision Height (format 3)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200
	MDA (format 3)	6.2.51	170	16	±65536 FT	Basic	1.0	200
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-40	Decision Height (format 3)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200
	MDA (format 3)	6.2.51	170	16	±65536 FT	Basic	1.0	200

Table 5.3.8-255: Radio Altitude Input Select Type 255 (ARINC 429 via dual IOC buses)

CHANNEL 429RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-36	Decision Height (format 1)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Radio Altitude	6.2.29	164	16	±8192 FT	Basic	0.125	25-50
B = J2-40	Decision Height (format 1)	6.2.41	370	16	±8192 FT	Basic	0.125	100-200

5.3.9 Category 9, Navigation Input Select

The following table provides identification of the Navigation type. The entry in the Navigation Type corresponds to a table that provides detailed information on the configuration. For example, the details for Navigation Type #1 are found in Table 5.3.9-1. In this category, only the following signals are defined:

- Glideslope source selection.
- Localizer source selection.
- PFD Mode Select Word
- Selected Course

Note: Numerous (but not all) Envelope Modulation cases require a localizer input. Therefore, a NAV ID that supplies both Glideslope and Localizer should be selected in this category, if possible. However, due to hardware limitations, use of Localizer for installations that can only provide low level GS validity is not supported. In these cases, only ID #1 can be selected. Envelope Modulation will still function for those locations which do not require a Localizer input, but not for those that require Localizer.

TABLE 5.3.9: NAVIGATION INPUT SELECT

ID	Navigation Inputs Select (Table 5.3.9-x)	Description	Software Effectivity	EGPWS Effectivity	
				MKVI	MK VIII
0	0	Analog Glideslope (ARINC 547) with +28V Validity Flag	-020	X	X
1	1	Analog Glideslope (ARINC 547) with Low Level Validity	-020	X	X
2	2	Digital Glideslope (ARINC 429)	-020	X	X
3	3	Digital Glideslope and Localizer (ARINC 429)	-020	X	X
4	4	Digital KN40 Glideslope and Localizer (ARINC 429)	-020	X	X
5	5	Analog Glideslope/Localizer (ARINC 547) with +28V Validity Flag	-020	X	X
250	250	Digital Glideslope, Localizer, PFD Word and Selected Course (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X
251	251	Digital Glideslope, Localizer and Selected Course (ARINC 429 via dual IOC buses) (Note 2)	-020	N/A	X
252	252	Digital Glideslope and Localizer – Alternate Input Channels (ARINC 429 via dual IOC buses) (Note 2)	-020	N/A	X
253	253	Digital Glideslope and Localizer (ARINC 429 via dual IOC buses) (Note 2)	-020	N/A	X
254	254	Digital Glideslope, Localizer and PFD Word (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X
255	255	Digital Glideslope and Localizer – Alternate Labels (ARINC 429 via dual IOC buses) (Note 2)	-020	N/A	X

Note 1: ID 250 and 254 may only be used in conjunction with other IOC bus selections for categories 2,6,8,10,11 and 12. The use of either the left or right source is based on the displayed source provided on label 163.

Note 2: ID 251, 252, 253, and 255 may only be used in conjunction with other IOC bus selections for categories 2,6,8,10,11 and 12.

Table 5.3.9-0: Navigation Inputs Select 0

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Glideslope Deviation	(+) = J1-65 (-) = J1-46	6.1.6 4.2.3.2	Format: ARINC 547 with Validity Flag & ILS Select Input Type: Basic Fault Designation: GLIDESLOPE FAULT Validity: Glideslope Validity Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**Reference**
Glideslope Validity Discrete #1	J1-11	Input	28V_DISC_06	>+17V = Valid < +4.4V = Not Valid	6.6.10 4.2.7
+28V ILS Tuned Discrete #1	J1-39	Input	28V_DISC_01	>+17V = ILS Tuned < +4.4V = ILS Not Tuned	6.6.9 4.2.7
GND ILS Tuned Discrete #1	J1-20	Input	GND_DISC_01	Gnd = ILS Tuned <not> Gnd = ILS Not Tuned	6.6.8 4.2.7

Table 5.3.9-1: Navigation Inputs Select 1

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Glideslope Deviation	(+) = J1-65 (-) = J1-46	6.1.7 4.2.3.2	Format: ARINC 547 with Low Level Validity & ILS Select Input Type: Basic Fault Designation: GLIDESLOPE FAULT Validity: Low Level Glideslope Deviation Validity		
Low Level Glideslope Deviation Validity	(+) = J1-30 (-) = J1-10	6.1.14 4.2.3.3	Format: DC Input Type: Basic Fault Designation: GLIDESLOPE LOW LEVEL VALIDITY FAULT > 0.145V = Valid (typical active range is 0.16V to 0.84V) <= 0.145V = Invalid		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**Reference**
+28V ILS Tuned Discrete #1	J1-39	Input	28V_DISC_01	>+17V = ILS Tuned < +4.4V = ILS Not Tuned	6.6.9 4.2.7
GND ILS Tuned Discrete #1	J1-20	Input	GND_DISC_01	Gnd = ILS Tuned <not> Gnd = ILS Not Tuned	6.6.8 4.2.7

Table 5.3.9-2: Navigation Inputs Select 2

CHANNEL 429RX_6	CONNECT TO: ILS #1 Format: ARINC 429 (Low Speed)		Fault Designation: ILS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-22 B = J2-5	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6

Table 5.3.9-3: Navigation Inputs Select 3

CHANNEL 429RX_6	CONNECT TO: ILS #1 Format: ARINC 429 (Low Speed)		Fault Designation: ILS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-22	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-5	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6

Table 5.3.9-4: Navigation Inputs Select 4

CHANNEL 429RX_6	CONNECT TO: ILS #1 Format: ARINC 429 (Low Speed)		Fault Designation: ILS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-22	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-5	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
	ILS Select (VOR/ILS Freq)	6.2.46	034	Discrete	n/a	Basic	Bit 14 = ILS	167-333

Configuration Data	Type	Reference Section
KN40 Nav Source	True	

Table 5.3.9-5: Navigation Inputs Select 5

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Glideslope Deviation	(+) = J1-65 (-) = J1-46	6.1.6 4.2.3.2	Format: ARINC 547 with Validity Flag & ILS Select Input Type: Basic Fault Designation: GLIDESLOPE FAULT Validity: Glideslope Validity Discrete #1 (+28V)		
Localizer Deviation	(+) = J1-30 (-) = J1-10	6.1.17 4.2.3.3	Format: ARINC 547 with Validity Flag & ILS Select Input Type: Basic Fault Designation: LOCALIZER FAULT Validity: Glideslope Validity Discrete #1 (+28V)		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**Reference**
Localizer Validity Discrete #1	J1-48	Input	28V_DISC_11	>+17V = Valid < +4.4V = Not Valid	6.6.28 4.2.7
Glideslope Validity Discrete #1	J1-11	Input	28V_DISC_06	>+17V = Valid < +4.4V = Not Valid	6.6.10 4.2.7
+28V ILS Tuned Discrete #1	J1-39	Input	28V_DISC_01	>+17V = ILS Tuned < +4.4V = ILS Not Tuned	6.6.9 4.2.7
GND ILS Tuned Discrete #1	J1-20	Input	GND_DISC_01	Gnd = ILS Tuned <not> Gnd = ILS Not Tuned	6.6.8 4.2.7

Table 5.3.9-250: Navigation Inputs Select 250

CHANNEL 429/422RX_1	**CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
	PFD Mode Select Word	6.2.44	163	Discrete	Type 4	Basic	n/a	250
	Selected Course	6.2.61	100	11	±180 degrees	Basic	0.087890625	200
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
	PFD Mode Select Word	6.2.44	163	Discrete	Type 4	Basic	n/a	250
	Selected Course	6.2.61	100	11	±180 degrees	Basic	0.087890625	200

Table 5.3.9-251: Navigation Inputs Select 251

CHANNEL 429/422RX_1	**CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 1 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-100
	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-100
	Selected Course	6.2.61	100	11	±180 degrees	Basic	0.087890625	33.3-100
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-100
	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-100
	Selected Course	6.2.61	100	11	±180 degrees	Basic	0.087890625	33.3-100

Table 5.3.9-252: Navigation Inputs Select 252

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-39	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-38	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-21	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-04	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6

Table 5.3.9-253: Navigation Inputs Select 253

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-36	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-40	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6

Table 5.3.9-254: Navigation Inputs Select 254

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-36	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
	PFD Mode Select Word	6.2.44	163	Discrete	Type 4	Basic	n/a	250
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Glideslope	6.2.30	174	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-40	Localizer	6.2.33	173	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
	PFD Mode Select Word	6.2.44	163	Discrete	Type 4	Basic	n/a	250

Table 5.3.9-255: Navigation Inputs Select 255

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Glideslope	6.2.30	117	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-36	Localizer	6.2.33	116	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Glideslope	6.2.30	117	12	±0.8 DDM	Basic	0.0001953125	33.3-66.6
B = J2-40	Localizer	6.2.33	116	12	±0.4 DDM	Basic	0.00009765625	33.3-66.6

5.3.10 Category 10, Attitude Input Select

The following table provides identification of the Attitude Roll Angle type. The entry in the Attitude Input Select corresponds to a table that provides detailed information on the configuration. For example, the details for Attitude Input Select #2 are found in 5.3.10-2.

In this category, only the following signals are defined:

- Roll Attitude.
- Pitch Attitude
- Roll Rate
- Pitch Rate
- Normal Acceleration
- Longitudinal Acceleration
- Inertial Vertical Speed
- Inertial Altitude

Table 5.3.10: Attitude Input Select

ID	Attitude Input Select (Table 5.3.10-x)	Description	Software Effectivity	EGPWS Effectivity	
				MKVI	MKVIII
0	0	Analog Roll without validity (3-Wire Synchro)	-020	X	X
1					
2	2	Analog Pitch and Roll (3-Wire Synchro)	-020	X	X
3					
4	4	Analog Roll with validity (3-Wire Synchro)	-020	X	X
5	5	Digital Pitch and Roll (ARINC 429 High Speed) (Note 2)	-020	X	X
6	6	Digital Pitch, Roll, and Vertical Speed (ARINC 429 High Speed) (Note 2)	-020	X	X
253	253	Digital Pitch, Roll, Vertical Speed and Altitude (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X
255	255	Digital Roll and Acceleration (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X

Note 1: ID 253 and 255 may only be used in conjunction with other IOC bus selections for categories 2,6,8,9,11 and 12.
Note 2: Category 10 and Category 11 use the same ARINC 429 receiver if a digital source is selected.

Table 5.3.10-0: Attitude Input Select Type 0

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA
Roll Attitude	(X) = J1-1 (Y) = J1-21 (Z) = J1-2	6.1.8	Format: 3 Wire Synchro Input Type: Basic Fault Designation: ROLL FAULT Validity: None Reference: None

Table 5.3.10-2: Attitude Input Select Type 2

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Roll Attitude	(X) = J1-1 (Y) = J1-21 (Z) = J1-2	6.1.15	Format: 3 Wire Synchro with Validity Flag Input Type: Basic Fault Designation: ROLL FAULT Validity: Attitude Validity Discrete #1 Reference: None		
Pitch Attitude	(X) = J1-5 (Y) = J1-7 (Z) = J1-6	6.1.12	Format: 3 Wire Synchro with Validity Flag Input Type: Basic Fault Designation: PITCH FAULT Validity: Attitude Validity Discrete #1 Reference: None		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/ Configuration**	**References**
Attitude Validity Discrete #1	J1-68	Input	28V_DISC_12	>+17V = Valid <+4.4V = Invalid	6.6.24 4.2.7

Table 5.3.10-4: Attitude Input Select Type 4

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Roll Attitude	(X) = J1-1 (Y) = J1-21 (Z) = J1-2	6.1.15	Format: 3 Wire Synchro with Validity Flag Input Type: Basic Fault Designation: ROLL FAULT Validity: Attitude Validity Discrete #1 Reference: None		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/ Configuration**	**Summary Data**
Attitude Validity Discrete #1	J1-68	Input	28V_DISC_12	>+17V = Valid <+4.4V = Invalid	6.6.24 4.2.7

Table 5.3.10-5: Attitude Input Select Type 5

CHANNEL 429RX_7	CONNECT TO: AHRS Format: ARINC 429 (High Speed)			Fault Designation: AHRS BUS Bus Type: Basic				
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-23	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-6	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20

Table 5.3.10-6: Attitude Input Select Type 6

CHANNEL 429RX_7	CONNECT TO: AHRS Format: ARINC 429 (High Speed)			Fault Designation: AHRS BUS Bus Type: Basic				
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-23	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-6	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20
	Body Roll Rate	6.2.50	327	13	±128 deg/sec	Basic	0.01562500	10-20
	Body Pitch Rate	6.2.49	326	13	±128 deg/sec	Basic	0.01562500	10-20
	Inertial Vertical Speed	6.2.56	365	15	±32,768 fpm	Basic	1.0	20-40

Table 5.3.10-253: Attitude Input Select Type 253

CHANNEL 429RX_7	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)			Fault Designation: IOC BUS 1 Bus Type: Basic				
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-36	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20
	Body Roll Rate	6.2.50	327	13	±128 deg/sec	Basic	0.01562500	10-20
	Body Pitch Rate	6.2.49	326	13	±128 deg/sec	Basic	0.01562500	10-20
	Inertial Vertical Speed	6.2.56	365	15	±32,768 fpm	Basic	1.0	20-40
	Inertial Altitude	6.2.57	361	20	±131,072 ft	Basic	0.125	20-40
CHANNEL 429RX_7	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**			**Fault Designation: IOC BUS 2 Bus Type: Basic**				
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-40	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20
	Body Roll Rate	6.2.50	327	13	±128 deg/sec	Basic	0.01562500	10-20
	Body Pitch Rate	6.2.49	326	13	±128 deg/sec	Basic	0.01562500	10-20
	Inertial Vertical Speed	6.2.56	365	15	±32,768 fpm	Basic	1.0	20-40
	Inertial Altitude	6.2.57	361	20	±131,072 ft	Basic	0.125	20-40

Note: ID 253 may only be used with Category 2 'digital' Barometric Altitude Rate sources, analog sources are not compatible with Inertial Vertical Speed.

Table 5.3.10-255: Attitude Input Select Type 255

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)				Fault Designation: IOC BUS 1 Bus Type: Basic			
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-36	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20
	Normal Acceleration	6.2.42	333	12	±4 g's	Basic	0.000977 g's	10-20
	Longitudinal Acceleration	6.2.43	331	12	±4 g's	Basic	0.000977 g's	10-20
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**				**Fault Designation: IOC BUS 2 Bus Type: Basic**			
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Roll Angle	6.2.31	325	14	±180 degrees	Basic	0.010986328125	10-20
B = J2-40	Pitch Angle	6.2.34	324	14	±180 degrees	Basic	0.010986328125	10-20
	Normal Acceleration	6.2.42	333	12	±4 g's	Basic	0.000977 g's	10-20
	Longitudinal Acceleration	6.2.43	331	12	±4 g's	Basic	0.000977 g's	10-20

Note: The output for Normal Acceleration reads 0 g's nominal when aircraft is on the ground, or during unaccelerated level flight.

5.3.11 Category 11, Heading Input Select

The following table provides identification of the Heading type. The entry in the Heading Input Select corresponds to a table that provides detailed information on the configuration. For example, the details for Magnetic Heading Input Select #0 are found in Table 5.3.11-0.

In this category, only the following signals are defined:

- Magnetic Heading
- True Heading

Table 5.3.11: Heading Input Select

ID	Heading Input Select (Table 5.3.11-x)	Description	Software Effectivity	EGPWS Effectivity	
				MKVI	MK VIII
0	0	Analog Magnetic Heading (3-Wire Synchro with reference and validity discrete)	-020	X	X
1					
2	2	Digital Magnetic Heading (High Speed ARINC 429) (Note 2)	-020	X	X
3	3	Digital Magnetic Heading and True Heading (High Speed ARINC 429) (Note 2)	-020	X	X
254	254	Digital True Heading (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X
255	255	Digital Magnetic Heading (ARINC 429 via dual IOC buses) (Note 1)	-020	N/A	X

Note 1: ID 254 and 255 may only be used in conjunction with other IOC bus selections for categories 2,6,8,9,10 and 12.
Note 2: Category 10 and Category 11 use the same ARINC 429 receiver if a digital source is selected.

Table 5.3.11-0: Heading Input Select 0

SIGNAL	CONNECTION	REFERENCE	SUMMARY DATA		
Magnetic Heading	(X) = J1-22 (Y) = J1-23 (Z) = J1-3 Reference (H) = J1-4 (C) = J1-24	6.1.9 4.2.4.2 4.2.4.4	Format: 5 Wire Synchro with Validity Flag Input Type: Basic Fault Designation: MAGNETIC HEADING FAULT Validity: Magnetic Heading Validity Discrete (+28V) Reference: Nominal 26 VAC		
PIN FUNCTION	**CONNECTION**	**PIN TYPE**	**CHANNEL DESIGNATION REFERENCE**	**Polarity/Configuration**	**References**
Magnetic Heading Validity Discrete	J1-28	Input	28V_DISC_10	>+17V = Valid < +4.4V = Invalid	6.6.23 4.2.7

Table 5.3.11-2: Heading Input Select Type 2

CHANNEL 429RX_7	CONNECT TO: AHRS Format: ARINC 429 (High Speed)		Fault Designation: AHRS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-23 B = J2-6	Magnetic Heading	6.2.32	320	15	±180 degrees	Basic	0.0054931640625	10-20

Table 5.3.11-3: Heading Input Select Type 3

CHANNEL 429RX_7	CONNECT TO: AHRS Format: ARINC 429 (High Speed)		Fault Designation: AHRS BUS Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-23	Magnetic Heading	6.2.32	320	15	±180 degrees	Basic	0.0054931640625	10-20
B = J2-6	True Heading	6.2.37	314	15	±180 degrees	Basic	0.0054931640625	25-50

Table 5.3.11-254: Heading Input Select 254

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	True Heading	6.2.32	314	15	±180 degrees	Basic	0.0054931640625	25-50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	True Heading	6.2.32	314	15	±180 degrees	Basic	0.0054931640625	25-50

Table 5.3.11-255: Heading Input Select 255

CHANNEL 429/422RX_1	CONNECT TO: IOC #1 Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37 B = J2-36	Magnetic Heading	6.2.32	320	15	±180 degrees	Basic	0.0054931640625	25-50
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41 B = J2-40	Magnetic Heading	6.2.32	320	15	±180 degrees	Basic	0.0054931640625	25-50

5.3.12 Category 12, Windshear Input Select

The following table provides identification of the Windshear Input Type. The entry in the Windshear Input Type corresponds to a table that provides detailed information on the configuration. For example, the details for Windshear Input Type #255 are found in 5.3.12-255.

In this category, only the following signals are to be defined:

- Body Angle of Attack (AOA) in ARINC 429 format
- Normalized Angle of Attack (AOA) in ARINC 429 format

Table 5.3.12: Windshear Input Select

ID	Windshear Input Type	Description	Windshear Disable	Windshear INOP Disable	Windshear Caution Disable	Windshear Caution Voice Disable	Software Effectivity	EGPWS Effectivity	
								MKVI	MKVIII
0	N/A	No Windshear	TRUE	TRUE	TRUE	TRUE	-020	X	X
253	255	Digital – ARINC 429 AOA (via Dual IOC buses). (Note 1)	FALSE	FALSE	TRUE	TRUE	-020	N/A	X
254	255	Digital – ARINC 429 AOA (via Dual IOC buses). (Note 1)	FALSE	FALSE	FALSE	TRUE	-020	N/A	X
255	255	Digital – ARINC 429 AOA (via Dual IOC buses). (Note 1)	FALSE	FALSE	FALSE	FALSE	-020	N/A	X

Note 1: IDs 253, 254, and 255 may only be used in conjunction with other IOC bus selections for categories 2, 6, 8, 9, 10, and 11.

Table 5.3.12-255: Windshear Input Type 255

CHANNEL 429RX_1	CONNECT TO: IOC #1 Bus Format: ARINC 429 (High Speed)		Fault Designation: IOC BUS 1 Bus Type: Basic					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-37	Left Angle of Attack Body	6.2.44	224	12	±180 degrees	Basic	0.0439453125 deg	100
B = J2-36	Normal Angle of Attack	6.2.52	236	15	0 to 1	Basic	0.00003051757812	80
CHANNEL 429RX_3	**CONNECT TO: IOC #2 Bus Format: ARINC 429 (High Speed)**		**Fault Designation: IOC BUS 2 Bus Type: Basic**					
	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
A = J2-41	Right Angle of Attack Body	6.2.45	225	12	±180 degrees	Basic	0.0439453125 deg	100
B = J2-40	Normal Angle of Attack	6.2.52	236	15	0 to 1	Basic	0.00003051757812	80

5.3.13 Category 13, Input / Output Discrete Type Select

The following table provides identification of the Input/Output Discrete Type. Each entry in the Input/Output Discrete Type column has a corresponding table that provides detailed information on the configuration. For example, the details for Input/Output Discrete Type #0 are found in Table 5.3.13-0.

Table 5.3.13: Input/Output Discrete Type Select

ID	Input/Output Discrete Type (Table 5.3.13-x)	Description	Software Effectivity	EGPWS Effectivity	
				MKVI	MKVIII
0	0	Input / Output discrete definitions (Lamp format 1)	-020	X	X
1	1	Input / Output discrete definitions (Lamp format 2)	-020	X	X
2	2	Input / Output discrete definitions (Lamp format 1) with GPWS Inhibit	-020	X	X
3	3	Input / Output discrete definitions (Lamp format 2) with GPWS Inhibit	-020	X	X
4	4	Input / Output discrete definitions (Lamp format 1, Flashing lamps) with GPWS Inhibit.	-020	X	X
5	5	Input / Output discrete definitions (Lamp format 2, Flashing lamps) with GPWS Inhibit.	-020	X	X
6	6	Input / Output discrete definitions (Lamp format 1) with GPWS Inhibit and Mom. Steep Approach Select.	-020	X	X
7	7	Input / Output discrete definitions (Lamp format 2) with GPWS Inhibit and Mom. Steep Approach Select.	-020	X	X
254	254	Windshear Input / Output discrete definitions (Lamp Format 1).	-020	N/A	X
255	255	Windshear Input / Output discrete definitions (Lamp Format 2).	-020	N/A	X

Table 5.3.13-0: Input/Output Discrete Type 0

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.1 7.4.7.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete (Glideslope Only)	7.4.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID. (Note 3)		
J2-15	28V_DISC_13	Input	Not Defined in this ID. (Note 3)		
J1-50	MON_OUT_3	Output	Not Defined in this ID. (Note 3)		
J1-52	DISC_OUT_7	Output	Not Defined in this ID. (Note 3)		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 1
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting.
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-1: Input/Output Discrete Type 1

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Warning Obstacle Awareness Warning	7.4.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete Terrain Awareness Caution Obstacle Awareness Caution	7.4.1 7.4.7.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		
J1-52	DISC_OUT_7	Output	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 2
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting.
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-2: Input/Output Discrete Type 2

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.1 7.4.7.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete (Glideslope Only)	7.4.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		
J1-52	DISC_OUT_7	Output	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 1
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting.
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-3: Input/Output Discrete Type 3

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Warning Obstacle Awareness Warning	7.4.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete Terrain Awareness Caution Obstacle Awareness Caution	7.4.1 7.4.7.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		
J1-52	DISC_OUT_7	Output	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 2
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-4: Input/Output Discrete Type 4

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		
J1-52	DISC_OUT_7	Output	Not Defined in this ID (Note 3).		
					Flashing Lamps
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete (Flashing) Terrain Awareness Caution or Warning (Flashing) Obstacle Awareness Caution or Warning (Flashing)	7.4.1 7.4.7.1 7.4.7.2	Yes Yes Yes
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete (Glideslope Only) (Flashing)	7.4.1	Yes
Configuration Data			**Possible States**		**State**
Lamp Format			Type 1,Type 2		Type 1
Flashing Lamps			True, False		True

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting.
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-5: Input/Output Discrete Type 5

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		
J1-52	DISC_OUT_7	Output	Not Defined in this ID (Note 3).		
					Flashing Lamps
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Warning Obstacle Awareness Warning	7.4.1 7.4.7.2	Yes Yes Yes
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete Terrain Awareness Caution Obstacle Awareness Caution	7.4.1 7.4.7.1	Yes Yes Yes

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 2
Flashing Lamps	True, False	True

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-6: Input/Output Discrete Type 6

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 1,4) (momentary)	6.6.25	Gnd = Toggle on/off <not> Gnd = Normal
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.1 7.4.7.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete (Glideslope Only)	7.4.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-52	DISC_OUT_7	Output	Steep Approach Discrete	7.4.14	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 1
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting.
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-7: Input/Output Discrete Type 7

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1,4)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-14	GND_DISC_07	Input	Momentary Flap Override Discrete (Note 1,4)	6.6.6	Gnd = Flap Override Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2,4)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1,4)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 1,4) (momentary)	6.6.25	Gnd = Toggle on/off <not> Gnd = Normal
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Warning Obstacle Awareness Warning	7.4.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete Terrain Awareness Caution Obstacle Awareness Caution	7.4.1 7.4.7.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Flap Override Discrete	7.4.5	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-52	DISC_OUT_7	Output	Steep Approach Discrete	7.4.14	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		
J1-50	MON_OUT_3	Output	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 2
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting
Note 3: This discrete may be used in another category.
Note 4: Function is provided as an OR operation of the physical discrete and the 429 discrete word bit, if configured by the display type.

Table 5.3.13-254: Input/Output Discrete Type 254

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete/ Flap Override Switch (non-momentary)	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete/ Flap Override Switch (non-momentary)	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2) (alternate action)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-50	MON_OUT_3	Output	Windshear INOP	7.4.9	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.1 7.4.7.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete (Glideslope Only)	7.4.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Windshear Warning Discrete	7.4.10	
J1-52	DISC_OUT_7	Output	Windshear Caution Discrete	7.4.11	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J1-14	GND_DISC_07	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 1
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting
Note 3: This discrete may be used in another category.

Table 5.3.13-255: Input/Output Discrete Type 255

CONN PIN #	CHANNEL DESIGNATION REFERENCE	PIN TYPE	PIN FUNCTION	Ref	Polarity/Configuration
J1-38	28V_DISC_02	Input	+28V Glideslope Inhibit Discrete	6.6.12	>+17V = Inhibit <+4.4V = Not Inhibit
J1-19	GND_DISC_02	Input	GND Glideslope Inhibit Discrete	6.6.11	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-37	28V_DISC_03	Input	+28V Landing Flaps Discrete/ Flap Override Switch (non-momentary)	6.6.5	>+17V = Flaps Up <+4.4V = Not Flaps Up
J1-18	GND_DISC_03	Input	GND Landing Flaps Discrete/ Flap Override Switch (non-momentary)	6.6.4	Gnd = Flaps Up <not> Gnd = Not Flaps Up
J1-36	28V_DISC_04	Input	+28V Audio Inhibit Discrete	6.6.17	>+17V = Inhibit <+4.4V = Not Inhibit
J1-17	GND_DISC_04	Input	GND Audio Inhibit Discrete	6.6.16	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-35	28V_DISC_05	Input	+28V Landing Gear Discrete	6.6.3	>+17V = Gear Down <+4.4V = Gear Up
J1-16	GND_DISC_05	Input	GND Landing Gear Discrete	6.6.2	Gnd = Gear Down <not> Gnd = Gear Up
J1-15	GND_DISC_06	Input	Glideslope Cancel Discrete (Note 1)	6.6.13	Gnd = Cancel Toggle <not> Gnd = Normal
J1-13	GND_DISC_08	Input	Mode 6 Low Volume Discrete	6.6.15	Gnd = Low Volume <not> Gnd = Normal
J1-8	28V_DISC_09	Input	Autopilot Engaged Discrete #1	6.6.21	>+17V = Engaged <+4.4V = Not Engaged
J1-12	GND_DISC_09	Input	Terrain Awareness & TCF Inhibit Discrete (Note 2)	6.6.20	Gnd = Inhibit <not> Gnd = Not Inhibit
J1-34	GND_DISC_10	Input	Self-Test Discrete (Note 1)	6.6.7	Gnd = Self-Test Toggle <not> Gnd = Normal
J1-67	GND_DISC_14	Input	GPWS Inhibit Discrete	6.6.27	Gnd = Inhibit <not> Gnd = Not Inhibit
J2-31	GND_DISC_15	Input	Steep Approach Discrete #2 (Note 2)	6.6.25	Gnd = Selected <not> Gnd = Not Selected
J1-72	MON_OUT_1	Output	GPWS INOP Discrete	7.4.3	
J1-55	MON_OUT_2	Output	TAD INOP Discrete Terrain Not Available	7.4.3	
J1-50	MON_OUT_3	Output	Windshear INOP	7.4.9	
J1-78	DISC_OUT_1	Output	GPWS Warning Discrete Terrain Awareness Warning Obstacle Awareness Warning	7.4.1 7.4.7.2	
J1-77	DISC_OUT_2	Output	GPWS Alert Discrete Terrain Awareness Caution Obstacle Awareness Caution	7.4.1 7.4.7.1	
J1-76	DISC_OUT_3	Output	Glideslope Cancel Discrete	7.4.6	
J1-73	DISC_OUT_4	Output	Windshear Warning Discrete	7.4.10	
J1-52	DISC_OUT_7	Output	Windshear Caution Discrete	7.4.11	
J1-69	DISC_OUT_5	Output	Audio On Discrete	7.4.2	
J1-54	DISC_OUT_6	Output	Terrain Display Select #1 Discrete	7.4.4	
J1-51	DISC_OUT_8	Output	Terrain Awareness Caution or Warning Obstacle Awareness Caution or Warning	7.4.7.3	Gnd = Terrain Pop Up
J1-49	DISC_OUT_9	Output	Terrain Display Select #2 Discrete	7.4.4	
J1-48	28V_DISC_11	Input	Not Defined in this ID (Note 3).		
J1-14	GND_DISC_07	Input	Not Defined in this ID (Note 3).		
J2-15	28V_DISC_13	Input	Not Defined in this ID (Note 3).		

Configuration Data	Possible States	State
Lamp Format	Type 1,Type 2	Type 2
Flashing Lamps	True, False	False

Note 1: Provided by Momentary cockpit switch (non-latching)
Note 2: Provided by Alternate cockpit switch (Latching) with guard if inhibiting
Note 3: This discrete may be used in another category.

5.3.14 Category 14, Audio Output Level

The following table provides identification of the Audio Output Level Select. Each entry in the ID column corresponds to a particular nominal alert output level selection (Max, -6 dB, -12 dB, -18dB and –24dB). The nominal "Max" output is 4 W(rms) for the 8-ohm output and 100 mW(rms) for the 600-ohm output. The Audio Output Level can be additionally reduced by 6dB with the Mode 6 Low Volume discrete (see Category 13). The output power level will be the nominal maximum output (4W or 100mW) reduced by the volume selection from Table 5.3.14 and the Mode 6 Low Volume discrete.

Table 5.3.14: Audio Output Level

ID	Volume Select	Software Effectivity
0	Nominal (Equivalent to classic MK VI MAX)	-020
1	-6 dB	-020
2	-12 dB	-020
3	-18 dB	-020
4	-24 dB	-020

5.3.15 Category 15, Undefined for this software release

The following table provides identification for a future undefined input select category. The entry in the following undefined Type corresponds to a table that will provide detailed information on the configuration. The details for Undefined Type #0 are not detailed.

Table 5.3.15: Undefined Type

ID	Undefined Type		Description			Software Effectivity	EGPWS	
							MKVI	MKVIII
0	N/A					-020	X	X

5.3.16 Category 16, Undefined for this software release

The following table provides identification for a future undefined input select category. The entry in the following undefined Type corresponds to a table that will provide detailed information on the configuration. The details for Undefined Type #0 are not detailed.

Table 5.3.16: Undefined Type

ID	Undefined Type		Description			Software Effectivity	EGPWS	
							MKVI	MKVIII
0	N/A					-020	X	X

5.3.17 Category 17, Undefined for this software release

The following table provides identification for a future undefined input select category. The entry in the following undefined Type corresponds to a table that will provide detailed information on the configuration. The details for Undefined Type #0 are not detailed.

Table 5.3.17: Undefined Type

ID	Undefined Type		Description			Software Effectivity	EGPWS	
							MKVI	MKVIII
0	N/A					-020	X	X

6 CONFIGURABLE INPUT DATA DEFINITION

This section defines the EGPWS input signal characteristics or data word formats for input signals commonly used in MK VI and VIII EGPWS applications. See Section 5 for specific information on signal usage.

6.1 Analog Input Data

6.1.1 ARINC 552 Radio Altimeter

Data Item	Value
Signal Name:	Radio Altitude, ARINC 552
AIC Algorithm:	ARINC 552A Radio Altitude
Signal Dynamic Range:	–100 to +3566 Feet
Signal Reasonable Range:	–30 to +2800 Feet
Signal Open Wire Threshold	–50 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	For Radio Altitude ≤ 480 feet: $Volts_{in}$ = (0.02 * RALT (ft)) + 0.4 For Radio Altitude > 480 feet: $Volts_{in} = 10 \times (1 + Ln\ (\frac{RALT\ (ft)\ + 20}{500}))$
Input Signal Connection:	(+) = J1-64, (–) = J1-45
Input Reference Connection:	None
AIC Name:	D1 (DC1)
External Validity Flag Connection:	J1-29
AIC LSB:	0.25 Feet
AIC Status Mask:	0000200C
External Validity Type:	Discrete Validity

6.1.2 ALT 55 Radio Altimeter

Data Item	Value
Signal Name:	Radio Altitude, ALT 55
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–100 to +3200 Feet
Signal Reasonable Range:	–30 to +2800 Feet
Signal Open Wire Threshold	–50 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	For Radio Altitude ≤ 500 Feet (≤ 10.4 VDC): $Volts_{in}$ = (0.02 * RALT) + 0.4 or RALT (ft) = 50 ft/VDC * $Volts_{in}$ – 20 ft For Radio Altitude > 500 feet (> 10.4 VDC): $Volts_{in}$ = 0.003 * (RALT –500) + 10.4 or RALT (ft) = 333.3333 ft/VDC * $Volts_{in}$ – 2966.7
Input Signal Connection:	(+) = J1-64, (–) = J1-45
Input Reference Connection:	None
AIC Name:	D1 (DC1)
External Validity Flag Connection:	J1-29
AIC LSB:	0.25 Feet
AIC Status Mask:	0000200C
External Validity Type:	Discrete Validity

6.1.3 Uncorrected Barometric Altitude

Data Item	Value
Signal Name:	Uncorrected Baro Altitude, DC Voltage
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–19,334 to +31,166 Feet
Signal Reasonable Range:	–1500 to +30,000 Feet
Signal Open Wire Threshold	–3000 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Altitude (Feet) = 3150 Feet/VDC * Volts – 17250 Feet
Input Signal Connection:	(+) = J1-62, (–) = J1-43
Input Reference Connection:	None
AIC Name:	D2 (DC2)
External Validity Flag Connection:	J1-9
AIC LSB:	2 Feet
AIC Status Mask:	0000200F
External Validity Type:	Discrete Validity

6.1.4 Outside Air Temperature (500 ohm probe)

Data Item	Value	
Signal Name:	Outside Air Temperature, DC Signal	
AIC Algorithm:	DC Absolute	
Signal Dynamic Range:	–85 to +60 °C	
Signal Reasonable Range:	–70 to +60 °C	
Signal Open Wire Threshold	–80 °C	
Reference Dynamic Range:	None	
Reference Reasonable Range:	None	
Scale:	V_{OAT}	OAT (in °C)
	< 0.43448	525.50676* V_{OAT} – 268.805
	>= 0.43448 and < 0.49212	545.64369* V_{OAT} – 277.560
	>= 0.49212 and < 0.54816	566.02357* V_{OAT} – 287.594
	>= 0.54816	581.96990* V_{OAT} – 296.270
Input Signal Connection:	(+) = J1-63, (–) = J1-44 (see section 5.3.2 for hookup)	
Input Reference Connection:	None	
AIC Name:	D5 (DC5)	
External Validity Flag Connection:	None	
AIC LSB:	0.03125 °C	
AIC Status Mask:	0000200F	
External Validity Type:	None	

6.1.5 Outside Air Temperature (Internal Constant)

Data Item	Value
Signal Name:	Outside Air Temperature, DC Signal
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	Constant, no external connection
Signal Reasonable Range:	Constant, no external connection
Signal Open Wire Threshold	None
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	OAT (in °C) = 25°C Constant
Input Signal Connection:	(no external connection)
Input Reference Connection:	None
AIC Name:	None

External Validity Flag Connection:	None
AIC LSB:	0.03125 °C
AIC Status Mask:	00000000
External Validity Type:	None

6.1.6 ARINC 547/578-4 Low Level Glideslope Deviation with Discrete Valid

Data Item	Value
Signal Name:	Low Level Glideslope Deviation, DC Signal
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	±16 Dots
Signal Reasonable Range:	±12 Dots
Signal Open Wire Threshold	–15 Dots
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	GS Deviation (Dots) = 13.333333 Dots/VDC * $Volts_{in}$ – (Positive = Fly Down) (75 mV per DOT, 0 Volts = 0 DOT) **NOTE:** To be consistent with the ARINC 429 definition G/S scaling inverts sign of input signal such that positive numbers are fly down.
Input Signal Connection:	(+) = J1-65 (above beam), (–) = J1-46 (below beam)
Input Reference Connection:	None
AIC Name:	D3 (DC3)
External Validity Flag Connection:	J1-11 (+28 VDC discrete)
AIC LSB:	0.00048828 Dots
AIC Status Mask:	0000200C
External Validity Type:	Discrete Validity

6.1.7 ARINC 547/578-4 Low Level Glideslope Deviation with Low Level Valid

Data Item	Value
Signal Name:	Low Level Glideslope Deviation, DC Signal
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	±16 Dots
Signal Reasonable Range:	±12 Dots
Signal Open Wire Threshold	–15 Dots
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	GS Deviation (Dots) = 13.333333 Dots/VDC * $Volts_{in}$ – (Positive = Fly Down) (75 mV per DOT, 0 Volts = 0 DOT) **NOTE:** To be consistent with the ARINC 429 definition G/S scaling inverts sign of input signal such that positive numbers are fly down.
Input Signal Connection:	(+) = J1-65 (above beam), (–) = J1-46 (below beam)
Input Reference Connection:	None
AIC Name:	D3 (DC3)
External Validity Flag Connection:	(+) = J1-30, (–) = J1-10 (GS low level validity see 6.1.21)
AIC LSB:	0.00048828 Dots
AIC Status Mask:	0000200C
External Validity Type:	Low Level Validity

6.1.8 Roll Attitude, 3 Wire Synchro (11.8 VAC)

Data Item	Value
Signal Name:	Roll Attitude, 3 Wire Synchro
AIC Algorithm:	3 Wire Synchro (11.8 VAC)
Signal Dynamic Range:	±90° Synchro Angle (15.5 VAC max)
Signal Reasonable Range:	±80° Synchro Angle

Signal Open Wire Threshold	None
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Roll Angle (deg) = 1 deg/deg
Input Signal Connection:	(X) = J1-1, (Y) = J1-21, (Z) = J1-2
Input Reference Connection:	None
AIC Name:	S1 (Synchro #1)
External Validity Flag Connection:	None
AIC FIFO LSB:	0.00549316°
AIC Status Mask:	0000010F
External Validity Type:	None

6.1.9 Magnetic Heading, 5 Wire Synchro

The Magnetic Heading will be corrected with the internal Magnetic Variable Table.

Data Item	Value
Signal Name:	Magnetic Heading, 5 Wire Synchro
AIC Algorithm:	5 Wire Synchro (11.8V)
Signal Dynamic Range:	±180° Synchro Angle (15.5 VAC max)
Signal Reasonable Range:	±180°
Signal Open Wire Threshold	None
Reference Dynamic Range:	17 - 34 VAC
Reference Reasonable Range:	None
Scale:	Mag Hdg (deg) = 1 deg/deg
Input Signal Connection:	(X) = J1-22, (Y) = J1-23, (Z) = J1-3
Input Reference Connection:	(H) = J1-4, (C) = J1-24
AIC Name:	S2 (Synchro #2)
External Validity Flag Connection:	J1-28
AIC FIFO LSB:	0.00549316°
AIC Status Mask:	0000070F
External Validity Type:	Discrete Validity, +28VDC

6.1.10 Uncorrected Barometric Altitude (ADS-65)

Data Item	Value
Signal Name:	Uncorrected Baro Altitude, DC Voltage
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–5514 to +128,080 Feet
Signal Reasonable Range:	–1500 to +46,000 Feet
Signal Open Wire Threshold	–3000 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Altitude (Feet) = 8333.33 Feet/VDC * Volts
Input Signal Connection:	(+) = J1-62, (–) = J1-43
Input Reference Connection:	None
AIC Name:	D2 (DC2)
External Validity Flag Connection:	J1-9
AIC LSB:	2 Feet
AIC Status Mask:	0000200F
External Validity Type:	Discrete Validity

6.1.11 RT-221/300 Radio Altimeter

Data Item	Value
Signal Name:	Radio Altitude, RT-221/300
AIC Algorithm:	DC Absolute

Signal Dynamic Range:	–100 to +3200 Feet
Signal Reasonable Range:	–30 to +2800 Feet
Signal Open Wire Threshold	–50 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	RALT (ft) = 250 ft/VDC * $Volts_{in}$
Input Signal Connection:	(+) = J1-64, (–) = J1-45
Input Reference Connection:	None
AIC Name:	D1 (DC1)
External Validity Flag Connection:	J1-29
AIC LSB:	0.25 Feet
AIC Status Mask:	0000200C
External Validity Type:	Discrete Validity

6.1.12 Pitch Synchro Attitude, 3 Wire Synchro (11.8 VAC)

Data Item	Value
Signal Name:	Pitch Attitude, 3 Wire Synchro
AIC Algorithm:	3 Wire Synchro (11.8 VAC)
Signal Dynamic Range:	±90° Synchro Angle (15.5 VAC max)
Signal Reasonable Range:	±80° Synchro Angle
Signal Open Wire Threshold	None
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Pitch Angle (deg) = 1 deg/deg
Input Signal Connection:	(X) = J1-5, (Y) = J1-7, (Z) = J1-6
Input Reference Connection:	None
AIC Name:	S3 (Synchro #3)
External Validity Flag Connection:	J1-68 (Common Validity with Roll Attitude 6.1.15)
AIC FIFO LSB:	0.00549316°
AIC Status Mask:	0000010F
External Validity Type:	Discrete Validity

6.1.13 Uncorrected Barometric Altitude (CIC 02702)

Data Item	Value
Signal Name:	Uncorrected Baro Altitude, DC Voltage
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–3713 to +62,017 Feet
Signal Reasonable Range:	–1000 to +40,000 Feet
Signal Open Wire Threshold	–3000 Feet
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Altitude (Feet) = 4100 Feet/VDC * Volts – 1000 Feet
Input Signal Connection:	(+) = J1-62, (–) = J1-43
AIC Name:	D2 (DC2)
Input Reference Connection:	None
External Validity Flag Connection:	J1-9
AIC LSB:	2 Feet
AIC Status Mask:	0000200F
External Validity Type:	Discrete Validity

6.1.14 ARINC 547/578-4 Low Level Glideslope Deviation Validity

Data Item	Value
Signal Name:	Low Level Glideslope Validity, DC Signal
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–1.1 to +1.5 VDC
Signal Reasonable Range:	–0.5 to +1.5 VDC
Signal Open Wire Threshold	–1 VDC
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	GS Validity (VDC) = $Volts_{in}$
Input Signal Connection:	(+) = J1-30, (–) = J1-10
Input Reference Connection:	None
AIC Name:	D4 (DC4)
External Validity Flag Connection:	None
AIC LSB:	0.0012207 VDC
AIC Status Mask:	0000200C
External Validity Type:	None

6.1.15 Roll Attitude, 3 Wire Synchro (11.8 VAC) with Validity

Data Item	Value
Signal Name:	Roll Attitude, 3 Wire Synchro
AIC Algorithm:	3 Wire Synchro (11.8 VAC)
Signal Dynamic Range:	±90° Synchro Angle (15.5 VAC max)
Signal Reasonable Range:	±80° Synchro Angle
Signal Open Wire Threshold	None
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Roll Angle (deg) = 1 deg/deg
Input Signal Connection:	(X) = J1-1, (Y) = J1-21, (Z) = J1-2
Input Reference Connection:	None
AIC Name:	S1 (Synchro #1)
External Validity Flag Connection:	J1-68
AIC FIFO LSB:	0.00549316°
AIC Status Mask:	0000010F
External Validity Type:	Discrete Validity

6.1.16 Uncorrected Barometric Altitude (AZ-241, AZ-800)

Data Item	Value
Signal Name:	Uncorrected Baro Altitude, DC Voltage
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	–3750 to +52,750 Feet (0.0 Vdc to +11.30 Vdc)
Signal Reasonable Range:	–1000 to +50,000 Feet (+0.55 Vdc to +10.75 Vdc)
Signal Open Wire Threshold	–1950 Feet (+0.36 Vdc)
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Altitude (Feet) = 5000 Feet/VDC * Volts – 3750 (0.2 mVdc/foot, 0.75 Vdc = 0 feet)
Input Signal Connection:	(+) = J1-62, (–) = J1-43
AIC Name:	D2 (DC2)
Input Reference Connection:	None
External Validity Flag Connection:	J1-9

AIC LSB:	2 Feet
AIC Status Mask:	0000200F
External Validity Type:	Discrete Validity, 28V

6.1.17 ARINC 547 Localizer Deviation with Discrete Valid

Data Item	Value
Signal Name:	LocalizerDeviation, DC Signal
AIC Algorithm:	DC Absolute
Signal Dynamic Range:	±16 Dots
Signal Reasonable Range:	±12 Dots
Signal Open Wire Threshold	–15 Dots
Reference Dynamic Range:	None
Reference Reasonable Range:	None
Scale:	Loc Deviation (Dots) = 13.333333 Dots/VDC * $Volts_{in}$ Positive = Fly Right 75 mV per DOT, 0 Volts = 0 DOT
Input Signal Connection:	(+) = J1-30 (fly right), (–) = J1-10 (fly left)
Input Reference Connection:	None
AIC Name:	D4 (DC4)
External Validity Flag Connection:	J1-48 (+28 VDC discrete)
AIC LSB:	0.00126 Dots
AIC Status Mask:	0000200C
External Validity Type:	Discrete Validity

6.2 Digital Input Data, ARINC 429

The MK VI/VIII EGPWC supports 8 ARINC 429 digital receivers used to monitor broadcast data from other LRUs and to support interactive protocols. Each receiver channel follows the characteristics of reference document Digital Information Transfer System (DITS), ARINC Characteristic 429.

Transmission System Interconnect. Each 429 receiver shall be connected to an ARINC 429 transmitter by means of a single twisted and shielded pair of wires. The shield shall be grounded at both ends and at all production breaks in the cable to an aircraft ground close to the rack connector.

Receiver Bus Frequency. Receivers are capable of operating at both Low and High speed and are determined by configuration selection. The following table identifies the bus speed characteristics.

Bus Speed	Bus Frequency
High	100 KBPS +/- 1%
Low	12.0 KBPS to 14.5 KBPS

ARINC Receiver Bus Identification. Each ARINC Receiver Channel is identified with two identifiers, one for each leg of the twisted wire pair. The identifier is formed as follows:

429RX[Channel Id][Leg] where Channel Id ranges [1-8], and Leg is A for the positive leg and B for the negative leg (see channel 1 exception in following paragraph). An example of a channel identifier would be 429RX-2A, which identifies leg A of ARINC 429 channel 2.

In addition, one of the ARINC 429 channels is connected to an UART to provision for RS422 operation. In this case the channel identifier has been defined as 429_422RX_1A and 429_422RX_1B

SIGN/STATUS Matrix The number of BITS, and the meaning of these BITS, varies depending on the type of data in the ARINC word.

BINARY (BNR) DATA					
BIT 31	BIT 30	DEFINITION		BIT 29	DEFINITION
0	0	Failure Warning		0	Plus, North, East, Right, To, Above
0	1	No Computed Data (NCD)			
1	0	Functional Test		1	Minus, South, West, Left, From, Below
1	1	Normal Operation			

BINARY CODED DECIMAL (BCD) DATA		
BIT 31	BIT 30	DEFINITION
0	0	Plus, North, East, Right, To, Above
0	1	No Computed Data (NCD)
1	0	Functional Test
1	1	Minus, South, West, Left, From, Below

Unless identified as using the Honeywell Discrete definition all data indicated as 'Discrete' uses the following SSM definition. (Note that PWS uses a non-standard SSM format as described in section 6.2.21)

DISCRETE DATA		
BIT 31	BIT 30	DEFINITION
0	0	Normal Operation
0	1	No Computed Data NCD
1	0	Functional Test
1	1	Not Used

Data identified as Honeywell Discrete uses the SSM definition below.

HONEYWELL DISCRETE DATA		
BIT 31	BIT 30	DEFINITION
0	0	Normal Operation
0	1	No Computed Data NCD
1	0	Functional Test
1	1	Failure Warning

ISO 5 ALPHABET

Some ARINC 429 labels transmit data using the ISO 5 alphabet as defined in the following table.

B4	B3	B2	B1	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
0	0	0	0	NUL		SP	0		P	MCDU MENU	SEL1
0	0	0	1	CNTRL	DC1	!	1	A	Q	PROG	SEL2
0	0	1	0	STX	DC2	"	2	B	R	PERF	SEL3
0	0	1	1	ETX	DC3	#	3	C	S	INIT	SEL4
0	1	0	0	EOT	DC4		4	D	T	DATA	SEL5
0	1	0	1	ENQ	NAK	%	5	E	U	FPLN	SEL6
0	1	1	0	ACK	SYN	&	6	F	V	RAD NAV	
0	1	1	1			'	7	G	W	FUEL PRED	NEXT PAGE
1	0	0	0	CLEAR	LOGOFF	(	8	H	X	SEL F-PLN	SER1
1	0	0	1	EVENT		)	9	I	Y	SPARE	SER2
1	0	1	0			*	:	J	Z		SER3

B4	B3	B2	B1	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
1	0	1	1			+	;	K	[		SER4
1	1	0	0		DEGREE SYMBOL	,	<	L	\		SER5
1	1	0	1	<CR>	BOX	-	=	M	]		SER6
1	1	1	0		↓	.	>	N	↑	TRI-ANGLE	
1	1	1	1		→	/	?	O	←	DIA-MOND	

6.2.1 Uncorrected Barometric Altitude (203)

UNCORRECTED BAROMETRIC ALTITUDE		Source: ARINC 706 DADC or IOC	
LABEL (Octal) 203	Units: Feet	Max. Range: ± 131,072 Feet	Approx. LSB: 1 Foot
Data Bits: 12 to 28 = 17	+ = Above Sea Level (ASL)	Sign Bit: 29	Pad Bits: 11
Transmit Interval (mSec): 31.3 to 62.5 (50 if DAU)	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.2 Static Air Temperature (213)

STATIC AIR TEMPERATURE		Source: ARINC 706 DADC or IOC	
LABEL (Octal) 213	Units: Degrees Celsius	Max. Range: 512 Degrees C.	Approx. LSB: 0.25 Degree
Data Bits: 18 to 28 = 11	+ = Above ZERO	Sign Bit: 29	Pad Bits: 11 to 17
Transmit Interval (mSec): 250 to 500	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.3 Barometric Altitude Rate (212)

BAROMETRIC ALTITUDE RATE		Source: ARINC 706 DADC or IOC	
LABEL (Octal) 212	Units: Feet/Minute	Max. Range: ± 32,768 Ft/Min	Approx. LSB: 16 Ft/Min
Data Bits: 18 to 28 = 11	+ = Ascent	Sign Bit: 29	Pad Bits: 11 to 17
Transmit Interval (mSec): 31.3 to 62.5	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.4 Altitude (076) - GPS (MSL)

ALTITUDE – GPS (MSL)		Source: ARINC 743(A) GPSSU	
LABEL (Octal) 076	Units: Feet	Max. Range: 131,072 Feet	Approx. LSB: 0.125 Foot
Data Bits: 9 to 28 = 20	+ = Up	Sign Bit: 29	Pad Bits: None
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: None

6.2.5 Horizontal Integrity Limit (130) - GPS

GPS Horizontal Integrity Limit		Source: ARINC 743(A) GPS	
LABEL (Octal) 130	Units: Nautical Miles	Max. Range: 16	Approx. LSB: 0.00012207
Data Bit: 12 - 28 (see table below) = 17	+ = always positive	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 1000 ms	Data Type: BNR + discrete		SDI Bits: 9, 10

BIT ASSIGNMENT GPS HIL

Bit	Definition
11	Set to 1 whenever the receivers RAIM detects a non-isolatable satellite failure (NISF), set to 0 otherwise
12 – 28	Integrity limit in nautical miles

6.2.6 Ground Speed (112) - GPS

Ground Speed – GPS		Source: ARINC 743(A) GPSSU	
LABEL (Octal) 112	Units: Knots	Max. Range: 4,096 Knots	Approx. LSB: 0.125 Knot
Data Bits: 14 to 28 = 15	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.7 Latitude (110) - GPS

LATITUDE – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 110	Units: Degrees	Max. Range: ± 180 Degrees	Approx. LSB: 0.000172 Deg
Data Bits: 9 to 28 = 20	+ = North	Sign Bit: 29	Pad Bits: None
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.8 Longitude (111) - GPS

LONGITUDE – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 111	Units: Degrees	Max. Range: ± 180 Degrees	Approx. LSB: 0.000172 Deg
Data Bits: 9 to 28 = 20	+ = East	Sign Bit: 29	Pad Bits: None
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.9 Track Angle (103) - GPS

TRACK ANGLE – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 103	Units: Degrees	Max. Range: ± 180 Degrees	Approx. LSB: 0.0055 Deg.
Data Bits: 15 to 29 = 15	+ = Clockwise from North	Sign Bit: 29	Pad Bits: 11 to 14
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.10 Horizontal Figure Of Merit (247) – GPS (ARINC 743A)

HORIZONTAL FIGURE OF MERIT - GPS			Source: ARINC 743A GPSSU
LABEL (Octal) 247	Units: Nautical Miles	Max. Range: 16 NM's	Approx. LSB: 0.000061035
Data Bits: 11 to 28 = 18	+ = N/A	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.11 Horizontal Figure Of Merit (247) – GPS (ARINC 743)

HORIZONTAL FIGURE OF MERIT - GPS			Source: ARINC 743 GPSSU
LABEL (Octal) 247	Units: Meters	Max. Range: 1,024	Approx. LSB: 0.03125
Data Bits: 14 to 28 = 15	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.12 Horizontal Figure Of Merit from HDOP (101) – GPS (ARINC 743)

HORIZONTAL FIGURE OF MERIT – GPS			Source: ARINC 743 GPSSU
LABEL (Octal) 101	Units: Meters	Max. Range: 16,384*	Approx. LSB: 0.5*
Data Bits: 14 to 28 = 15	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

* The HDOP scaling is multiplied by 16 to produce HFOM values required by the EGPWS

6.2.13 Vertical Figure Of Merit (136) – GPS (ARINC 743A)

VERTICAL FIGURE OF MERIT – GPS			Source: ARINC 743A GPSSU
LABEL (Octal) 136	Units: Feet	Max. Range: 32,768 ft	Approx. LSB: 0.125
Data Bits: 11 to 28 = 18	+ = N/A	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.14 Vertical Figure Of Merit (136) – GPS (ARINC 743)

VERTICAL FIGURE OF MERIT – GPS			Source: ARINC 743 GPSSU
LABEL (Octal) 136	Units: Meters	Max. Range: 1,024	Approx. LSB: 0.03125
Data Bits: 14 to 28 = 15	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.15 Vertical Figure Of Merit from VDOP (102) – GPS (ARINC 743)

VERTICAL FIGURE OF MERIT – GPS			Source: ARINC 743 GPSSU
LABEL (Octal) 102	Units: Meters	Max. Range: 16,384*	Approx. LSB: 0.5*
Data Bits: 14 to 28 = 15	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

* The VDOP scaling is multiplied by 16 to produce VFOM values required by the EGPWS

6.2.16 Sensor Status (273) - GPS

SENSOR STATUS – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 273	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: 11 to 29 = 19 See TABLE	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 1000 Maximum	Data Type: Discrete		SDI Bits: 9, 10

SENSOR STATUS BIT ASSIGNMENTS			
Bit No.	DEFINITION		
11	MSB of Satellites Visible (16 to 31)		
12	DADS Status (*)	Present = '0'	Not Present = '1'
13	DADS Source (*)	Primary = '0'	Secondary = '1'
14	IRS/FMS Status	Present = '0'	Not Present = '1'
15	IRS/FMS Source	Primary = '0'	Secondary = '1'
16 - 19	Number of Satellites Visible (0 to 15)		
20 - 23	Number of Satellites Tracked (0 to 15)		
24 - 25	Current System in Use	00 = GPS 10 = GLONASS 11 = GPS/GLONASS 01 = Spare	
26 - 28	Operational Mode	000 = Self Test Mode 001 = Initialization Mode 010 = Acquisition Mode 011 = Navigation Mode 100 = Altitude/Clock Aiding Mode 101 = Differential Mode 110 = Direction/Speed Aiding Mode 111 = Fault	
29	MSB of Satellites Tracked (16 to 31)		

(*) = DADS Input is NOT required if ALTITUDE Data to GPSSU Sensor is Received from IRS/FMS Inputs.

6.2.17 Universal Time Correlation (125) - GPS

UNIVERSAL TIME CORRELATION (UTC) (BCD)			Source: ARINC 743(A) GPSSU
LABEL (Octal) 125	Units: Hours:Minutes	Max. Range: See NOTE 1	Approx. LSB: 0.1 Minute
Data Bits: See NOTE 2	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 1000 Maximum	Data Type: BCD		SDI Bits: 9, 10

NOTE 1: Maximum value = 23:59.9
NOTE 2: BCD BIT Assignments per Table below:

UNIVERSAL TIME CORRELATION BIT ASSIGNMENTS		
BIT NO.	DEFINITION (CFDS/GPS)	DEFINITION (CAIMS)
11 - 14	Tenths of Minutes	UNITS of Minutes
15 - 18	UNITS of Minutes	TENS of Minutes
19 - 22	TENS of Minutes	UNITS of Hours
23 - 26	UNITS of Hours	TENS of Hours
27 - 29	TENS of Hours	N/A

6.2.18 Date (260) - GPS

DATE	Source: [AIRBUS] - ARINC 604 CFDS/ CMC/ [GPS] - ARINC 743(A) GPSSU		
LABEL (Octal) 260	Units: Day:Month:Year	Max. Range: N/A	Approx. LSB: 1 Day
Data Bits: 11 to 29 = 19 See NOTE 1	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 1000 Maximum	Data Type: BCD		SDI Bits: 9, 10

NOTE 1: BITS 11 to 14 (4) = UNITS of the YEAR (0 to 9)
BITS 15 to 18 (4) = TENS of the YEAR (0 to 9)
BITS 19 to 22 (4) = UNITS of the MONTH (0 to 9)

BIT 23 (1) = TENS of the MONTH (0 or 1)
BITS 24 to 27 (4) = UNITS of the DAY (0 to 9)
BITS 28 to 29 (2) = TENS of the DAY (0 to 3)

6.2.19 Control Word (154) - MFD

CONTROL WORD – MFD			Source: MFD
LABEL (Octal) 154	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 50 ms	Data Type: Discrete		SDI Bits: N/A

DAU WORD BIT ASSIGNMENTS	
Bit No.	DEFINITION
11 – 13	Not Used by EGPWC
14	Terrain Display Overlay Active
15 – 29	Not Used by EGPWC

6.2.20 Control Word 2 (271/273)

CONTROL WORD 2 – WXR **DISPLAY WD 1 – NAV DISPLAY BUS**			Source: WXR Control Panel/Nav Display
LABEL (Octal) 271 For FDS-255 display the label is 273.	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 100 to 120 ms	Data Type: Discrete		SDI Bits: N/A

CONTROL WORD 2 BIT ASSIGNMENTS	
Bit No.	DEFINITION
11	Special Function, Not Used by EGPWC
12	Anticlutter, Not Used by EGPWC
13	Windshear, Not Used by EGPWC
14 – 23	Spares
24 – 29	Display Range as specified in the table below

BITS 24 to 29 = Display Range (5 to 320NM, format as follows)

Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24	RANGE
0	0	0	0	0	0	320 NM
0	0	0	0	0	1	5 NM
0	0	0	0	1	0	10 NM
0	0	0	1	0	0	20 NM
0	0	1	0	0	0	40 NM
0	1	0	0	0	0	80 NM
1	0	0	0	0	0	160 NM

Note: The range bits are additive; e.g., if bits 24 and 26 = 1 then the range would be 25 NM.

6.2.20.1 Control Word 2 (271/273) Type 2

CONTROL WORD 2 – WXR (Type 2) **DISPLAY WD 1 – NAV DISPLAY BUS**			Source: IOC Bus
LABEL (Octal) 271 For FDS-255 display the label is 273.	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 100 ms	Data Type: Discrete		SDI Bits: N/A

CONTROL WORD 2 BIT ASSIGNMENTS	
Bit No.	DEFINITION
11–22	Spares
23	Display Range Divide by 20
24 – 29	Display Range as specified in the table below

BITS 24 to 29 = Display Range (5 to 320NM, format as follows)

Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24	RANGE
0	0	0	0	0	0	320 NM
0	0	0	0	0	1	5 NM
0	0	0	0	1	0	10 NM
0	0	0	1	0	0	20 NM
0	0	1	0	0	0	40 NM
0	1	0	0	0	0	80 NM
1	0	0	0	0	0	160 NM

Note: The range bits are additive; e.g., if bits 24 and 26 = 1 then the range would be 25 NM.

6.2.21 Discrete Word (155 or 176) - MFD

DISCRETE WORD – MFD			Source: MFD or IOC #1 & IOC #2	
LABEL (Octal) 155 or 176	Units: N/A	Max. Range: N/A	Approx. LSB: N/A	
Data Bits: Discrete word, see below	+ = N/A		Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 50 ms	Data Type: Discrete			SDI Bits: N/A

DAU WORD BIT ASSIGNMENTS	
Bit No.	DEFINITION
11 - 17	Not Used by EGPWC
18 - 24	Terrain Display Range as specified in the table below
25 - 29	Not Used by EGPWC

BITS 18 to 24 = Display Range (5 to 640 NM, Format as follows)

DISPLAY RANGE BIT ASSIGNMENTS			
Bits 24-18	DEFINITION	Bits 24-18	DEFINITION
All 7 bits zero:	640 NM	Bit 21 set:	40 NM
Bit 18 set:	5 NM	Bit 22 set:	80 NM
Bit 19 set:	10 NM	Bit 23 set:	160 NM
Bit 20 set:	20 NM	Bit 24 set:	320 NM

6.2.22 Hazard Range Output (077)

Hazard Range Output - Wx RADAR			Source: Wx Radar	
LABEL (Octal) 077	Units: N/A	Max. Range: N/A	Approx. LSB: N/A	
Data Bits: Discrete word, see below		+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 20 ms		Data Type: Discrete (non-standard SSM, see below)		SDI Bits: N/A

HAZARD RANGE OUTPUT BIT ASSIGNMENTS	
Bit No.	DEFINITION
11	Event Number LSB, Not Used by EGPWC
12	Event Number, Not Used by EGPWC
13	Event Number MSB, Not Used by EGPWC
14	Range (Start), 0.0625 NM, Not Used by EGPWC
15	Range (Start), 0.125 NM, Not Used by EGPWC

16	Range (Start), 0.25 NM, Not Used by EGPWC
17	Range (Start), 0.5 NM, Not Used by EGPWC
18	Range (Start), 1 NM, Not Used by EGPWC
19	Range (Start), 2 NM, Not Used by EGPWC
20	Range (Start), 4 NM, Not Used by EGPWC
21	Range (End), 0.0625 NM, Not Used by EGPWC
22	Range (End), 0.125 NM, Not Used by EGPWC
23	Range (End), 0.25 NM, Not Used by EGPWC
24	Range (End), 0.5 NM, Not Used by EGPWC
25	Range (End), 1 NM, Not Used by EGPWC
26	Range (End), 2 NM, Not Used by EGPWC
27	Range (End), 4 NM, Not Used by EGPWC
28	Alert level
29	Alert level

BITS 28 & 29 = Alert Level, format as follows

Bit 28	Bits 29	DEFINITION
0	0	No Alert
1	0	Level 1 (Advisory)
0	1	Level 2 (Caution)
1	1	Level 3 (Warning)

BITS 30 & 31 = SSM as follows

BIT 31	BIT 30	DEFINITION
0	0	Normal Operation
0	1	Invalid (fault)
1	0	Functional Test
1	1	NCD

6.2.23 Range (050) - Multifunction Signal Generator (MG) or IC600

RANGE – MG			Source: MG
LABEL (Octal) 050	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word containing both left and right ranges, see below	+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 100 ms	Data Type: Discrete		SDI Bits: N/A

Note: Data format identical to EPGWC output label 050.
BITS 11 to 14 = Left Terrain Display Range (0.5 to 2000NM, Format as follows)
BITS 15 to 18 = Right Terrain Display Range (0.5 to 2000NM, Format as follows)

MG Note: Range is on one of two buses depending on whether MG is backing up right side.

DISPLAY RANGE BIT ASSIGNMENTS			
Bits 14-11 Bits 18-15	DEFINITION	Bits 14-11 Bits 18-15	DEFINITION
0000	0.5 NM	1000	150 NM
0001	1.0 NM	1001	200 NM
0010	2.5 NM	1010	300 NM
0011	5.0 NM	1011	500 NM
0100	10 NM	1100	1000 NM
0101	25 NM	1101	2000 NM
0110	50 NM	1110	600 NM
0111	100 NM	1111	

6.2.24 Query / Continuous Response (011) - KCPB

QUERY / CONTINUOUS RESPONSE			Source: KCPB Display
LABEL (Octal) 011	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word	+ = N/A	Sign Bit: N/A	Pad Bits: None
Transmit Interval: Prompted Response or Continuous Response, 2-30 words/sec	Data Type: Discrete		SDI Bits: N/A

Label 011 communicates the response to the KCPB Query / Setup Label (KCPB Label 027) or on a continuous basis. For a detailed description of the Query / Continuous Response Label 011 definition see the EGPWS Interface Methodology, 060-4303-000.

6.2.25 Key Press Data (012) – KCPB

KEY PRESS DATA			Source: Honeywell TDU/FMS
LABEL (Octal) 012	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word	+ = N/A	Sign Bit: N/A	Pad Bits: None
Transmit Interval (mSec): 180	Data Type: Discrete		SDI Bits: 0

TDU/FMS key press data will be transmitted using Label 012. The state of the front panel keys will be transmitted nominally every 180 ms. Keys which are being pressed will be represented as logic "1" in the appropriate bit while non pressed keys will be registered as logic "0". For a detailed description of the Key Press / Display Mode Label 012 definition see the EGPWS Interface Methodology, 060-4303-000.

KEY PRESS DATA			Source: KCPB Display
LABEL (Octal) 012	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word	+ = N/A	Sign Bit: N/A	Pad Bits: None
Transmit Interval (mSec): at least 200 msec	Data Type: Discrete		SDI Bits: 0

Key press / Display Mode data will be transmitted using Label 012. This is an optional label for KCPB displays. The state of the front panel keys will be transmitted nominally every 200 ms. Keys which are being pressed will be represented as logic "1" in the appropriate bit while non pressed keys will be registered as logic "0". For a detailed description of the Key Press / Display Mode Label 012 definition see the EGPWS Interface Methodology, 060-4303-000.

6.2.26 Control Word 1 (270)

CONTROL WORD 1 – WXR			Source: WXR Control Panel
LABEL (Octal) 270	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: 9, 10
Transmit Interval (mSec): 100 ms	Data Type: Discrete		SDI Bits: N/A

CONTROL WORD 1 BIT ASSIGNMENTS	
Bit No.	DEFINITION
11	Scan, Not Used by EGPWC
12	Anticlutter, Not Used by EGPWC
13	Stabilization, Not Used by EGPWC
14	Mode
15	Mode
16	Mode
17	Tilt, +0.25 degrees
18	Tilt, +0.5 degrees
19	Tilt, +1.0 degrees
20	Tilt, +2.0 degrees
21	Tilt, +4.0 degrees
22	Tilt, +8.0 degrees
23	Tilt, -16.0 degrees (sign)
24	Gain, Bit –1
25	Gain, Bit –2
26	Gain, Bit –4
27	Gain, Bit –8
28	Gain, Bit –16
29	Gain, Bit –32

Bits 14 to 16 = Mode, format as follows

Bit 16	Bit 15	Bit 14	MODE
0	0	0	Standby
0	0	1	Weather Only
0	1	0	Map Only
0	1	1	Windshear Hazard Factor
1	0	0	Test
1	0	1	Windshear and Turbulence
1	1	0	Weather and Turbulence
1	1	1	Windshear Icon

6.2.27 Discrete Word (273) – Bendix Weather Radar Vertical Profile Mode

Discrete Word			Source: EFIS/Weather Radar
LABEL (Octal) 273	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bit: 11	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 100 ms	Data Type: Discrete		SDI Bits: 9, 10

Some display systems support a vertical profile WXR display where the radar scans up and down. This mode can not support a terrain display. Therefore when this mode bit is set (indicating that the profile mode is active) the EGPWS is to treat this as a non-displayable mode.

Mode	bit 11	Displayable
Vertical Profile On	1	No
Vertical Profile Off	0	Yes

6.2.28 Discrete Word (275) – IC600 only

Discrete Word - (IC600 Packed Discrete Word 4)			Source: IC
LABEL (Octal) 275	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Bit 17: See TABLE	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 500 ms	Data Type: Discrete		SDI Bits: 9, 10

BIT ASSIGNMENTS

Discrete Data	**Bit Definition**
IC outputting MFD format (its range is displayed)	Bit 17 = 1: IC Driving Display Bit 17 = 0: IC not Driving Display

6.2.29 Radio Altitude (164)

RADIO ALTITUDE			Source: ARINC 707 LRRA or IOC
LABEL (Octal) 164	Units: Feet	Max. Range: ± 8,192 Feet	Approx. LSB: 0.125 Foot
Data Bits: 13 to 28 = 16	+ = Above Ground Level (AGL)	Sign Bit: 29	Pad Bits: 11, 12
Transmit Interval (mSec): 25 to 50	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.30 Glideslope Deviation (174 or 117)

GLIDESLOPE DEVIATION			Source: ARINC 710 ILS or IOC
LABEL (Octal) 174 or 117	Units: See NOTE	Max. Range: ± 0.8 DDM	Approx. LSB: 0.000195 DDM
Data Bits: 17 to 28 = 12	+ = Fly Down = Above Beam C/L	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 33.3 to 66.6	Data Type: 2's Complement Binary		SDI Bits: 9, 10

NOTE: Units = Difference in Depth of Modulation (DDM) 0.0875 DDM = 1 'Dot'.

6.2.31 Roll Angle (325)

ROLL ANGLE			Source: ARINC 704 INU / IRS/ AHRS / FMS or IOC
LABEL (Octal) 325	Units: Degrees/180	Max. Range: ± 180 Degrees	Approx. LSB: 0.01099 Deg
Data Bits: 15 to 28 = 14	+ = Right Wing Down	Sign Bit: 29	Pad Bits: 11 to 14
Transmit Interval (mSec): 10 to 36	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.32 Magnetic Heading (320)

MAGNETIC HEADING			Source: ARINC 704 INU / IRS / AHRS / FMS or IOC
LABEL (Octal) 320	Units: Degrees/180	Max. Range: ± 180 Degrees	Approx. LSB: 0.00549 Degrees
Data Bits: 14 to 28 = 15	+ = Clockwise from North	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 10 to 50	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.33 Localizer Deviation (173 or 116)

LOCALIZER DEVIATION			Source: ARINC 710 ILS or IOC
LABEL (Octal) 173 or 116	Units: See NOTE	Max. Range: ± 0.4 DDM	Approx. LSB: 0.0000977 DDM
Data Bits: 17 to 28 = 12	+ = Fly RIGHT = Left of Beam C/L	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 33.3 to 66.6 115 ms max for IAC 100 ms max for IOC	Data Type: 2's Complement Binary		SDI Bits: 9, 10

NOTE: Units = Difference in Depth of Modulation (DDM) 0.0775 DDM = 1 'Dot'.

6.2.34 Pitch Angle (324)

PITCH ANGLE			Source: ARINC 704 INU / IRS/ AHRS / FMS or IOC
LABEL (Octal) 324	Units: Degrees/180	Max. Range: ± 180 Degrees	Approx. LSB: 0.01099 Deg
Data Bits: 15 to 28 = 14	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 14
Transmit Interval (mSec): 10 to 36	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.35 Range (271) - KCPB

RANGE			Source: KCPB Display
LABEL (Octal) 271	Units: NM	Max. Range: 1023.5	Approx. LSB: 0.5
Data Bits: 19 to 29 = 11	+ = N/A	Sign Bit: N/A	Pad Bits: 11-18
Transmit Interval (mSec): at least 200 msec.	Data Type: Binary		SDI Bits: 9,10

6.2.36 DSU Status Word (350)

DSU STATUS WORD			Source: DSU
LABEL (Octal) 350	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 1000 maximum	Data Type: Discrete		SDI Bits: 9,10

DSU STATUS WORD BIT ASSIGNMENTS	
Bit No.	DEFINITION
11	Power Up Program Memory Test (ROM_FAIL)
12	Power Up External RAM Test (RAM_FAIL)
13	Power Up UDI Video Dual Port RAM Test (UDIVM_FAIL)
15-14	Unused (always 0)
16	Continuous ARINC 453 Inactive Test (A453INACT_FAIL)
17	Continuous Display Range Validity Test (DISPRING_FAIL)
18	Continuous Unused Interrupts Test (UNUSEDINT_FAIL)

23-19	Unused (always 0)
24	Program Pin A Status
25	Program Pin B Status
26	Program Pin C Status
27	Program Pin D Status
28	Program Pin E Status
29	Unused (always 0)

6.2.37 True Heading (314)

TRUE HEADING			Source: IRS/AHRS/IOC
LABEL (Octal) 314	Units: Degrees/180	Max. Range: +/- 180 Degrees	Approx. LSB: 0.00549 Degrees
Data Bits: 14 to 28 = 15	+ = Clockwise from North	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 25 to 50	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.38 Corrected Barometric Altitude (204)

CORRECTED BAROMETRIC ALTITUDE			Source: ARINC 706 DADC or IOC
LABEL (Octal) 204	Units: Feet	Max. Range: 131,072 Feet	Approx. LSB: 1 Foot
Data Bits: 12 to 28 = 17	+ = Above Sea Level (ASL)	Sign Bit: 29	Pad Bits: 11
Transmit Interval (mSec): 31.3 to 62.5	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.39 Computed Airspeed (206)

COMPUTED AIRSPEED		Source: ARINC 706 DADC or IOC	
LABEL (Octal) 206	Units: Knots	Max. Range: 1,024 Knots	Approx. LSB: 0.0625 Knot
Data Bits: 15 to 28 = 14	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 14
Transmit Interval (mSec): 62.5 to 125(100 if DAU)	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.40 True Airspeed (210)

TRUE AIRSPEED		Source: IOC	
LABEL (Octal) 210	Units: Knots	Max. Range: 2,048 Knots	Approx. LSB: 0.0625 Knot
Data Bits: 14 to 28 = 15	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 62.5 to 125	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.41 Decision Height (370) – IOC Scaling

DECISION HEIGHT		Source: IOC	
LABEL (Octal) 370	Units: Feet	Max. Range: ±8192 FT See NOTE 1	Approx. LSB: 0.125 Foot
Data Bits: 13 to 28 = 16	+ = Above Ground Level (AGL)	Sign Bit: 29	Pad Bits: 11,12
Transmit Interval (mSec): 100 to 200	Data Type: 2's Complement Binary		SDI Bits: 9, 10

NOTE 1: Some IOC configurations may only provide positive ranges (0 to 8192 Feet), however the EGPWS supports both positive and negative ranges (+/- 8192 Feet) for all configurations.

NOTE 2: This label may be provided in a configuration with a single DH input or in conjunction with a selected MDA input. For those configurations which provide DH and MDA on separate labels, Format 3 applies (Format 1 is 0/0 SDI, Format 2 is Left SDI used and Format 3 is No SDI.)

6.2.42 Normal Acceleration (333)

NORMAL ACCELERATION			Source: IOC
LABEL (Octal) 333	Units: g's	Max. Range: +/-4.0 g's	Approx. LSB: 0.000977 g's
Data Bits: 17 to 28 = 12	+ = Up See NOTE	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 10 to 20	Data Type: 2's Complement Binary		SDI Bits: 9, 10

NOTE: Output reads 0 g's nominal when aircraft is on the ground, or during unaccelerated flight.

6.2.43 Longitudinal Acceleration (331)

LONGITUDINAL ACCELERATION			Source: IOC
LABEL (Octal) 331	Units: g's	Max. Range: +/-4.0 g's	Approx. LSB: 0.000977 g's
Data Bits: 17 to 28 = 12	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 10 to 20	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.44 Left Body Angle of Attack (224)

Body Angle of Attack			Source: IOC
LABEL (Octal) 224	Units: degrees	Max. Range: +/-180 degrees	Approx. LSB: 0.0439 degrees
Data Bits: 17 to 28 = 12	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 50 to 100	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.45 Right Body Angle of Attack (225)

Body Angle of Attack			Source: IOC
LABEL (Octal) 225	Units: degrees	Max. Range: +/-180 degrees	Approx. LSB: 0.0439 degrees
Data Bits: 17 to 28 = 12	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 16
Transmit Interval (mSec): 50 to 100	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.46 VOR/ILS Frequency (034)

VOR/ILS Frequency			Source: ARINC 710 ILS
LABEL (Octal) 034	Units: MHz	Max. Range: 108 - 117.95MHz	Approx. LSB: 10 kHz
Data Bits: See NOTE	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 167 to 333	Data Type: Binary Coded Decimal (BCD)		SDI Bits: 9, 10

NOTE: This input is used to indicate if the VOR/ILS receiver is tuned to an ILS frequency, or to a VOR frequency. BIT #14 will be set to a '0' for all VOR frequencies, and to a '1' for all ILS frequencies, by the tuning information source.

6.2.47 PFD Mode Select Word (163)

PFD MODE SELECT WORD – Type 4			Source: PFD via IOC
LABEL (Octal) 163	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: See NOTE 2 and 3	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): See NOTE 1	Data Type: Discrete		SDI Bits: N/A

NOTE 1: Transmit Interval for data from PFD via IOC is 250 mSec Maximum.
NOTE 2: BITS 25 to 28 contain Binary Code for Displayed Data Source, as listed below.
NOTE 3: BITS 19/20 indicate MDA selection status and BIT 21 indicates DH selection status, as listed below.

PFD Mode Select Word			
BIT NO.	DEFINITION		
19, 20	MDA Display Selection		
	Bit 19	Bit 20	
	0	0	MDA not selected
	1	0	MDA selected
	X	1	Not used
21	DH Display Selection		
	0	DH Not Selected	
	1	DH Selected	

25 – 28	Navigation data source currently displayed on the Primary Flight Display (PFD). The table below show decimal values with bit 25 the LSB * = Values currently used by EGPWC	
	00 = Not Used 01 = Not Used * 02 = VOR/LOC #1 * 03 = VOR/LOC #2 04 = FMS #1 05 = FMS #2 06 = FMS #3 07 = Not Used	* 08 = MLS #1 * 09 = MLS #2 * 10 = ILS #1 * 11 = ILS #2 12 = NOTE 1 13 = NOTE 1 14 = Not Used 15 = Not Used

NOTE 1: Code 12 and Code 13 are currently assigned to TACAN Data source. Neither of these states are used by the EGPWC to select or evaluate input data.

6.2.48 FWC & GP Discrete Word (171)

DISCRETE WORD – FWC & GP			Source: FWC or GP (#1 & #2)
LABEL (Octal) 171	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: Discrete word, see below	+ = N/A	Sign Bit: N/A	Pad Bits: none
Transmit Interval (mSec): 100	Data Type: Discrete		SDI Bits: 9, 10 See below

Note: Several formats exist for this label. Format 1: is the default format. Format 2: will be specified if required in the Display Input Control Group.

FWC or GP WORD BIT ASSIGNMENTS (Format 1)	
Bit No.	DEFINITION
	Note: Not all of the following bits are necessarily used on a given aircraft, but all will be processed. The usage depends on the aircraft avionics. For example, Steep Approach is only supported in a limited number of installations, however, the bits for Steep Approach are always monitored.
9, 10	SDI: 1/0 = Left Display Range; 0/1 = Right Display Range; 0/0 & 1/1 = No Range
11-14	Self Test command codes BIT 11 12 13 14 0 0 0 0 = No Test command 0 0 1 0 = Short Level 1 Test command 0 1 0 0 = Long Level 1 Test command 0 1 1 0 = Level 2 Test command 1 0 0 0 = Level 3 Test command 1 0 1 0 = Level 4 Test command 1 1 0 0 = Level 5 Test command 1 1 1 0 = Level 6 Test command 0 0 0 1 = Self Test Cancel command 0 0 1 1 = Skip command
15	Glideslope Cancel (momentary)
16	Flap Override (alternate action)
17	Terrain Awareness & TCF Inhibit
18	Auto Range confirm (alternate action)
19	Landing Gear Down
20	Weight on Wheels
21	Low Altitude (momentary)

22	Timed Audio Inhibit (momentary)
23	Reserved for EGPWS Test command Bit
24	Steep Approach activated (alternate action)
25-28	Terrain Display Range (as specified in the table below)
29	Not Used

BITS 25 to 28 = Terrain Display Range (0.5 to 2000 NM) format as follows:

DISPLAY RANGE BIT ASSIGNMENTS			
Bits 28-25	DEFINITION	Bits 28-25	DEFINITION
0000	0.5 NM	1000	150 NM
0001	1.0 NM	1001	200 NM
0010	2.5 NM	1010	300 NM
0011	5.0 NM	1011	500 NM
0100	10 NM	1100	1000 NM
0101	25 NM	1101	2000 NM
0110	50 NM	1110	600 NM
0111	100 NM	1111	1200 NM

6.2.49 Body Pitch Rate (326)

Body Pitch Rate			Source: AHRS / IOC
LABEL (Octal) 326	Units: Deg/Sec	Max. Range: +/-128 Degrees/Sec	Approx. LSB: 0.0156 Deg/Sec
Data Bits: 16 to 28 = 13	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 15
Transmit Interval (mSec): 10 to 20	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.50 Body Roll Rate (327)

Body Roll Rate			Source: AHRS / IOC
LABEL (Octal) 327	Units: Deg/Sec	Max. Range: +/-128 Degrees/Sec	Approx. LSB: 0.0156 Deg/Sec
Data Bits: 16 to 28 = 13	+ = Right Wing Down	Sign Bit: 29	Pad Bits: 11 to 15
Transmit Interval (mSec): 10 to 20	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.51 Minimum Descent Altitude (170) – IOC Scaling

Minimum Descent Altitude			Source: IOC
LABEL (Octal) 170	Units: Feet	Max. Range: ± 65,536 Feet [1]	Approx. LSB: 1 Foot
Data Bits: 13 to 28 = 16	+ = Above Sea Level (ASL)	Sign Bit: 29	Pad Bits: 9 to 12
Transmit Interval (mSec): 200	Data Type: 2's Complement Binary		SDI Bits: N/A [2]

Note 1: Some IOC configurations may only provide positive ranges (0 to 65536 feet), however the EGPWS supports both positive and negative ranges (±65,536 feet) for all configurations.

Note 2: This label may be provided in a configuration with a single DH input or in conjunction with a selected MDA input. For those configurations which provide DH and MDA on separate labels format 3 applies (Format 1 is 0/0 SDI, Format 2 is Left SDI used and Format 3 is no SDI.)

6.2.52 Normal Angle of Attack (236)

Normal Angle of Attack			Source: IOC
LABEL (Octal) 236	Units: N/A	Max. Range: 0 to 1	Approx. LSB: 0.000031
Data Bits: 14 to 28 = 15	+ = N/A	Sign Bit: N/A	Pad Bits: 11 to 13, 29
Transmit Interval (mSec): 80	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.53 North/South Velocity (166) - GPS

NORTH/SOUTH VELOCITY – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 166	Units: Knots	Max. Range: ± 4,096 Knots	Approx. LSB: 0.125 Knots
Data Bits: 14 to 28 = 15	+ = North	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.54 East/West Velocity (174) - GPS

EAST/WEST VELOCITY – GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 174	Units: Knots	Max. Range: ± 4,096 Knots	Approx. LSB: 0.125 Knots
Data Bits: 14 to 28 = 15	+ = East	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.55 Discrete Word (017) - KMD 550/850

Discrete Word			Source: KMD 550/850 display
LABEL (Octal) 017	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bits: 11	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): 200	Data Type: Discrete		SDI Bits: 9, 10

DISCRETE WORD BIT ASSIGNMENTS		
BIT NO.	DEFINITION	COMMENTS
11 - 16	Spares	
17	Self Test	Momentary
18	Terrain Awareness Inhibit	Latched
19	Low Altitude Mode Select	Momentary
20	Timed Audio Inhibit	Momentary
21	G/S Cancel	Momentary
22	Steep Approach	Momentary
23	Flap Override	Momentary
24 - 29	Spares	

6.2.56 Inertial Vertical Speed (365)

Inertial Vertical Speed			Source: ARINC 704 IRS/AHRS
LABEL (Octal) 365	Units: FPM	Max. Range: +/-32768 FPM	Approx. LSB: 1 FPM
Data Bits: 14 to 28 = 15	+ = Ascent	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 20 to 40	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.57 Inertial Altitude (361)

Inertial Altitude			Source: ARINC 704 IRS/AHRS
LABEL (Octal) 361	Units: Feet	Max. Range: +/-131,072 feet	Approx. LSB: 0.125 feet
Data Bits: 9 to 28 = 20	+ = Above Sea Level (ASL)	Sign Bit: 29	Pad Bits: None
Transmit Interval (mSec): 20 to 40	Data Type: 2's Complement Binary		SDI Bits: None

6.2.58 Vertical Velocity (165) - GPS

Vertical Velocity – GPS			Source: ARINC 743A GPSSU
LABEL (Octal) 165	Units: FPM	Max. Range: +/-32,768 FPM	Approx. LSB: 1 FPM
Data Bits: 14 to 28 = 15	+ = Ascent	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.59 Latitude Fine (120) - GPS

Latitude Fine - GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 120	Units: Degrees	Max. Range: +/-0.000172 Deg	Approx. LSB: $8.38E^{-8}$ Deg
Data Bits: 18 to 28 = 11	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 17
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.60 Longitude Fine (121) - GPS

Longitude Fine - GPS			Source: ARINC 743(A) GPSSU
LABEL (Octal) 121	Units: Degrees	Max. Range: +/-0.000172 Deg	Approx. LSB: $8.38E^{-8}$ Deg
Data Bits: 18 to 28 = 11	+ = N/A	Sign Bit: 29	Pad Bits: 11 to 17
Transmit Interval (mSec): 1000 Maximum	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.61 Selected Course (100) - IOC

Selected Course (BNR)			Source: IOC
LABEL (Octal) 100	Units: Degrees/180	Max. Range: +/-180 Degrees	Approx. LSB: 0.8789 Degrees
Data Bits: 18 to 28 = 11	+ = Clockwise from North	Sign Bit: 29	Pad Bits: 11 to 17
Transmit Interval (mSec): 100 to 500	Data Type: 2's Complement Binary		SDI Bits: 9, 10

6.2.62 DH/MDA Selected (170) – DAU Scaling

DH/MDA Selected				Source: DAU
LABEL (Octal) 170	Units: Feet	Max. Range (for DH): +/-4096 feet	Max. Range (for MDA): +/-16384 feet	Approx. LSB: 1 foot
Data Bits (for DH): 17 to 28 = 12	Data Bits (for MDA): 15 to 28 = 14	+ = Above Ground Level (ASL)	Sign Bit: 29	Pad Bits: 11
Transmit Interval (mSec): 1000		Data Type: 2's Complement Binary / Discrete		SDI Bits: 9, 10

Note: If Signal Displayed bit 13=1, MDA Selected is mapped to bit 14. SSM for this word uses the discrete word format.

6.3 Digital Data, ARINC 575

ARINC 575 data is very similar to the low speed ARINC 429 data described in the previous sections, but is one generation earlier in the aircraft serial data definition. As such, there is NO SDI Field, and the SIGN/STATUS Matrix for 2's Complement Binary data is different, and is given below for reference.

SIGN/STATUS Matrix: The number of BITS, and the meaning of these BITS, varies depending on the type of data in the ARINC 575 word.

ARINC 575 BINARY (BNR) DATA		
BIT 31	BIT 30	DEFINITION
0	0	Plus, North, East, Right, To, Above
0	1	Failure Warning
1	0	No Computed Data (NCD)
1	1	Minus, South, West, Left, From, Below

6.3.1 Static Air Temperature (213)

STATIC AIR TEMPERATURE			Source: ARINC 575 ADC
LABEL (Octal) 213	Units: Degrees Celsius	Max. Range: 512 Degrees C.	Approx. LSB: 0.5 Degree
Data Bits: 20 to 29 = 10	+ = Above ZERO	Sign Bit: Part of SSM	Pad Bits: 9 to 19
Transmit Interval (mSec): 500 Maximum	Data Type: 2's Complement Binary		SDI Bits: N/A

6.3.2 Uncorrected Barometric Altitude (203)

UNCORRECTED BAROMETRIC ALTITUDE			Source: ARINC 575 ADC
LABEL (Octal) 203	Units: Feet	Max. Range: ± 131,072 Feet	Approx. LSB: 1 Foot
Data Bits: 13 to 29 = 17	+ = Above Sea Level (ASL)	Sign Bit: Part of SSM	Pad Bits: 9 to 17
Transmit Interval (mSec): 62.5 Maximum	Data Type: 2's Complement Binary		SDI Bits: N/A

6.3.3 Barometric Altitude Rate (212)

BAROMETRIC ALTITUDE RATE			Source: ARINC 575 ADC
LABEL (Octal) 212	Units: Feet/Minute	Max. Range: ± 20,480 Ft/Min	Approx. LSB: 10 Ft/Min
Data Bits: 19 to 29 = 11	+ = Ascent	Sign Bit: Part of SSM	Pad Bits: 9 to 18
Transmit Interval (mSec): 62.5 Maximum	Data Type: 2's Complement Binary		SDI Bits: N/A

6.3.4 Computed Airspeed (206)

COMPUTED AIRSPEED			Source: ARINC 575 ADC
LABEL (Octal) 206	Units: Knots	Max. Range: ± 1024 Knots	Approx. LSB: 0.125 Knot
Data Bits: 17 to 29 = 13	+ = Forward	Sign Bit: Part of SSM	Pad Bits: 9 to 16
Transmit Interval (mSec): 125 Maximum	Data Type: 2's Complement Binary		SDI Bits: N/A

6.4 Digital Data, RS-232

RS-232 data can be received and transmitted from an internal GPS Pxpress card in a TTL voltage level for use as a GPS source. This data can also be received from a simulator in a TIA/EIA RS-232 format, which will be emulating the GPS data format of the GPS Pxpress card. The characteristics of the GPS Pxpress data is 9600 baud, 1 stop bit, 8 bit data, odd parity.

6.4.1 Xpress GPS Packets ID 15: Lat/Lon/Estimated Horizontal Position Error

Byte	Data	Type	Units
0	Valid Flag	Byte	Valid = 1, Invalid = 0
1-4	Latitude	Real	Radians (WGS 84)
5-8	Longitude	Real	Radians (WGS 84)
9-12	Horizontal Position Error (*)	Real	Meters

(*) Horizontal position error = 2 * standard deviation of horizontal position.

6.4.2 Xpress GPS Packets ID 16: Altitude/Estimated Vertical Position Error

Byte	Data	Type	Units
0	Valid Flag	Byte	Valid = 1, Invalid = 0
1-4	Altitude (*)	Real	Meters (MSL = WGS 84 - Geoid)
5-8	Vertical Position Error (**)	Real	Meters

(*) Altitude is MSL Altitude, which is computed from WGS 84 altitude by adding the geoid correction.
(**) Vertical position error = 2 * standard deviation of vertical position.

6.4.3 Xpress GPS Packets ID 17: Ground Speed/Track Angle

Byte	Data	Type	Units
0	Valid Flag	Byte	Valid = 1, Invalid = 0
1-4	Ground Speed	Real	Meters/Second
5-8	Track Angle	Real	Degrees (0..360)

6.4.4 Xpress GPS Packets ID 18: East/North/Up Velocity

Byte	Data	Type	Units
0	Valid Flag	Byte	Valid = 1, Invalid = 0
1-4	East Velocity	Real	Meters/Second
5-8	North Velocity	Real	Meters/Second
9-12	Up Velocity	Real	Meters/Second

6.4.5 Xpress GPS Packets ID 1C: GPS State

This packet contains information concerning the current state of the receiver subsystem.

Byte	Data	Type	Units
0	State	Byte	Discrete (*)
1	Integrity State	Byte	Bit Field (**)
2	Masked Integrity Warning	Byte	True = 1, False = 0 (***)
3	Bad Coverage	Byte	True = 1, False = 0 (****)
4	Altitude Aiding In Use	Byte	True = 1, False = 0
5	Nav Mode	Byte	Discrete (*****)
6-7	Error Status	Integer	Bit Field (******)

(*) State (binary)

00	initialization
01	search the sky
02	acquisition
03	transition
04	navigation
05	navigation with possible data collection
06	navigation with position degradation
07	dead reckoning

(**) Integrity State (true if set; false otherwise)

0	HDOP > 4.0	Set in approach mode when RAIM is not available and the computed HDOP exceeds 4.0
1	RAIM unavailable	Set when RAIM is not available in the current navigation mode
2	integrity warning	Set when a RAIM error is detected
3	RAIM unavailable (masked)	Set when RAIM is not available in the current navigation mode and a turn is not in progress
4	approach RAIM unavailable	Set when RAIM is unavailable in approach mode. This flag allows a "host" to do a crosscheck on the RAIM prediction result before it switches into approach mode. However, if the system is not currently using altitude aiding, this flag could be unnecessarily set and contradict with the RAIM prediction result, which may assume altitude aiding. Consequently, the “host” should disregard this flag when the predicted approach RAIM is available, the current NAV mode is not approach, altitude aiding is not in effect, and all satellites in the XPRESS visibility list are in a tracking state.
5	FDE unavailable	Set when FDE is not available in the current navigation mode. If the FDE becomes unavailable because of shading during a turn, it will be masked for the duration of the turn.
6	FE active	Set when FDE excludes a tracking satellite.
7	Pseudo integrity warning	Set when a RAIM error is detected whether or not RAIM is available in the current navigation mode.

(***) Masked Integrity Warning
True when there is a RAIM detected error or when RAIM is not available and a turn is not in progress

(****) Bad Coverage
True when there is insufficient satellite coverage for RAIM or NAV

(*****) NAV Mode (binary)

0	en route
1	terminal
2	approach
3	oceanic

(******) Error Status (true if set; false otherwise)

0	not used
1	ROM failure
2	RAM failure
3	Nonvolatile RAM lost
4	RF failure
5	not used
6	not used
7	BaseBand ASIC failure
8	BaseBand ASIC timeout
9	not used
10	RS-232 channel 1 receiver timeout
11	EEPROM failure
12	RS-232 channel 2 fail
13	1 millisecond underflow
14	not used
15	1 millisecond overflow

6.5 Digital Data, RS-422

The MK VI and MK VIII EGPWC supports up to 3 RS-422 digital receivers (with 2 receivers having transmit capability also) used to monitor broadcast data from other LRUs and to support interactive protocols. Each receiver channel follows the characteristics of reference document EIA 422.

Transmission System Interconnect. Each RS-422 receiver shall be connected to an RS-422 transmitter by means of a single twisted and shielded pair of wires. The shield shall be grounded at both ends and at all production breaks in the cable to an aircraft ground close to the rack connector.

Receiver Bus Frequency. Receivers are capable of operating up to 38.4K baud and are determined by configuration selection.

6.5.1 Honeywell RS-422 Serial Control Interface (SCI) Mode/Range Word

The Serial Control Interface is transmitted on an RS-422 data bus. The data stream consists of 13 words (a label byte followed by two data bytes) transmitted within 47 milliseconds. Each character consists of one bit (Low), 8 data bits with least significant bit first; an ODD parity bit and one stop bit (high). The most significant bit of the character is a label or data flag bit. The data rate of the SCI bus is 12 KBS ±0.01%. Channel 429_422RX_1 (J2-36/37) and 422RX_2 (J2-10/11) can be configured for this input. Only two of the words on the bus are decoded, Label 80 Mode/Range Word 1 and Label FF Status Word 1.

6.5.1.1 Serial Control Interface (SCI) Mode/Range Word 1 (80)

Mode/Range Word 1			Source: Map Electronics Unit (MEU)	
LABEL (Hex) 80	Units: N/A	Max. Range: N/A	Approx. LSB: N/A	
Data Bit: 1 – 8	+ = N/A		Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): See above	Data Type: Discrete			SDI Bits: N/A

Note this is an RS-422 serial data stream not ARINC 429 so SDI and SSM for this word are not applicable.

DISPLAY RANGE BIT ASSIGNMENTS				DISPLAY MODE BIT ASSIGNMENTS [1]		
Bits 4 - 7	Range	Bits 4 - 7	Range	Bits 1-3	Display Mode	Displayable
0100	0.5 NM	0110	150 NM	000	STBY	NO
0010	1.0 NM	1100	200 NM	001	WX	YES
1111	2.5 NM	1010	300 NM	010	MAP	NO
1011	5.0 NM	0001	500 NM	011	FLIGHT PLAN	NO
1101	10 NM	0101	1000 NM	100	TEST	NO
1001	25 NM	0011	2000 NM	101	WX/T	YES
1110	50 NM	0000	spare	110	CYC	NO
1000	100 NM	0111	spare	111	TRB	NO

[1] Display Mode used for "bolt-on" EDZ displays only.

6.5.1.2 Serial Control Interface (SCI) Status Word 1 (FF)

Status Word 1			Source: Map Electronics Unit (MEU)
LABEL (Hex) FF	Units: N/A	Max. Range: N/A	Approx. LSB: N/A
Data Bit: 1 – 8	+ = N/A	Sign Bit: N/A	Pad Bits: N/A
Transmit Interval (mSec): See above	Data Type: Discrete		SDI Bits: N/A

STATUS WORD BIT ASSIGNMENTS	
BIT	DEFINITION
1	SECTOR SCAN *
2	TARGET ENABLE
3	P-450
4	ERASE
5	VAR GAIN
6	SLAVE
7	RIGHT
8	0 (Always zero in data word)

* Sector Scan used for "bolt-on" EDZ displays only.

6.5.2 Honeywell RS-232 Serial Control Interface for DC811 Up/Down Range

The DC811 controller transmits a 6 byte data packet with spacing between bytes of 16.67 mSec. Each byte consists of one start bit (low), 8 data bits with least significant bit (LSB) first; an EVEN parity bit and one stop bit (high). The LSB of the first packet byte is set to 1 to indicate the start of the packet (the other 5 bytes will have the LSB set to 0). The data rate for this bus is 7.8125 KBS ± 0.01%. Depressing the Up or Down Range button will cause an Up or Down Range bit to be set for 1 packet period (approximately 100 mSec). After an Up or Down transition no additional changes will be allowed for approximately ½ second.

DC811 Data Packet		
BYTE	**BIT**	**DESCRIPTION**
1	0	1=Start of packet flag
2		
3		
4	6	1=Range increment
5	1	1=Range decrement
6		

EGPWS Up/Down Ranges Supported in Nautical Miles
2.5
5
10
25*
50
100

* (default on power up)

6.6 Discrete Inputs

This section contains a brief description of each input discrete is used in the EGPWS.

There are 28 possible discrete inputs each have one of the following input characteristics

1) 15 Open/Ground two state discretes

2) 13 Open/28VDC two state discretes

The EGPWS supports the following inputs in discrete form. *The Level 6 audio information specifies the voice issued when a state change occurs on the input discrete during level 6 self test.* Refer to the Product Specification for self test description.

6.6.1 Analog Radio Altitude Validity Flags

A Radio Altitude Validity Flag is used by the EGPWS for analog Radio Altimeter inputs.

Type: Validity from ARINC 552, ALT 55 Radio Altimeter or RT-200/300 (analog).

Signal Status: Valid or Invalid

	Level 6 Audio readout
Radio Altitude Validity Discrete #1	Valid => "Radio Altimeter 1 Valid" Invalid => "Radio Altimeter 1 Invalid"

6.6.2 GND Landing Gear Discrete

Type: Supplied by landing gear or landing gear selector handle position-sensitive switch. This input can be paralleled with, or used exclusively by a Gear Override Switch if an alternate source of Gear Position is used.

Signal Status: Landing Gear Down or Landing Gear Up

Fault monitoring: Indication of landing gear selected for more than 60 seconds at airspeeds above 290 (200 for GA Slow) knots will result in a gear switch fault which will cause a GPW INOP indication.

Note: This can be caused by either a gear switch fault or by the Gear Override switch being left in the on position.

	Level 6 Audio readout
Landing Gear Discrete or Gear Override	Landing Gear Down => "Landing Gear Down" Landing Gear Up => "Landing Gear Up"

6.6.3 +28V Landing Gear Discrete

Type: Supplied by landing gear or landing gear selector handle position-sensitive switch. This input can be paralleled with, or used exclusively by a Gear Override Switch if an alternate source of Gear Position is used.

Signal Status: Landing Gear Down or Landing Gear Up

Fault monitoring: Indication of landing gear selected for more than 60 seconds at airspeeds above 290 (200 for GA Slow) knots will result in a gear switch fault which will cause a GPW INOP indication.

Note: This can be caused by either a gear switch fault or by the Gear Override switch being left in the on position.

	Level 6 Audio readout
+28 V Landing Gear Discrete	Landing Gear Down => "28 Volts Landing Gear Down" Landing Gear Up => "28 Volts Landing Gear Up"

6.6.4 GND Landing Flap Discrete

Type: Supplied by Flap or Flap selector handle switch.

Signal Status: Landing Flaps or Not Landing Flaps

Fault monitoring: Indication of landing flaps selected for more than 60 seconds at airspeeds above 250 (180 for GA Slow) knots will result in a flap switch fault which will cause a GPW INOP indication.

Note: This can be caused by either a flap switch fault or by the Flap Override switch being left in the on position.

	Level 6 Audio readout
GND Landing Flaps Discrete or Flap Override	Landing Flaps => "Landing Flaps" Not Landing Flaps => "Not Landing Flaps"

6.6.5 +28V Landing Flap Discrete

Type: Supplied by Flap or Flap selector handle switch.

Signal Status: Landing Flaps or Not Landing Flaps

Fault monitoring: Indication of landing flaps selected for more than 60 seconds at airspeeds above 250 (180 for GA Slow) knots will result in a flap switch fault which will cause a GPW INOP indication.

Note: This can be caused by either a flap switch fault or by the Flap Override switch being left in the on position.

	Level 6 Audio readout
+28 V Landing Flaps Discrete or Flap Override	Landing Flaps => "Landing Flaps" Not Landing Flaps => "Not Landing Flaps"

6.6.6 Momentary Flap Override Discrete

Type: Supplied by a momentarily actuated cockpit switch.

Signal Status: Flap Override activated if not active or Flap Override canceled if currently active.

Fault Monitoring: Activation of this input continuously for more than 15 seconds will result in the 'Momentary Flap Override Invalid" fault which will cause a GPW INOP indication.

	Level 6 Audio readout
Momentary Flap Override	Flap Override Selected => "Flap Override" Flap Override Not Selected => "Not Flap Override"

6.6.7 Self-Test Discrete

Type: Supplied by a momentarily actuated cockpit self-test switch.

Signal Status: Self Test or Normal

Fault Monitoring: Activation of this input continuously for more than 60 seconds will result in the 'Self Test Invalid" fault which will cause a GPW INOP indication.

Note: This input is used to start and stop the Level 6 self test, there is no audio output for this discrete in Level 6.

6.6.8 GND ILS Tuned Discrete #1

Type: Supplied by ILS/VOR Mode Selector.

Signal Status: ILS tuned or VOR tuned

	Level 6 Audio readout
GND ILS Tuned Discrete #1	ILS Tuned => "ILS 1 Tuned" ILS Not Tuned => "ILS 1 Not Tuned"

6.6.9 +28V ILS Tuned Discrete #1

Type: Supplied by ILS/VOR Mode Selector.

Signal Status: ILS tuned or VOR tuned

	Level 6 Audio readout
+28 V ILS Tuned Discrete #1	ILS Tuned => "28 Volts ILS 1 Tuned" ILS Not Tuned => "28 Volts ILS 1 Not Tuned"

6.6.10 Glideslope Validity Discrete #1

A Glideslope Validity Discrete may be used by EGPWS, for the ARINC 547 Glideslope Receiver input.

Type: Validity from ARINC 547 Glideslope receiver.

Signal Status: Valid or Invalid

Note: Analog Glideslope monitoring requires that this input discrete (or the Analog Low Level Glideslope Validity Discrete) is always true whenever ILS is not tuned . In other words that the flag is biased out of view.

	Level 6 Audio readout
Glideslope Validity Discrete #1	Valid => "Glideslope 1 Valid" Invalid => "Glideslope 1 Invalid"

6.6.11 GND Glideslope Inhibit Discrete

Type: Switch for inhibit of Glideslope mode

Signal Status: Glideslope Inhibit or Not Inhibit

Mode 5 will be disabled and "Glideslope" will not be enunciated during cockpit Self Test and the long vocabulary test if inhibited.

	Level 6 Audio readout
Glideslope Inhibit Discrete	Inhibit => "Glideslope Inhibit True" Not Inhibit => "Glideslope Inhibit False"

6.6.12 +28 V Glideslope Inhibit Discrete

Type: Supplied by an alternate action latching cockpit switch for inhibit of Glideslope mode.

Signal Status: Glideslope Inhibit or Not Inhibit

Mode 5 will be inhibited and "Glideslope" will not be enunciated during cockpit Self Test and the long vocabulary test if inhibited.

	Level 6 Audio readout
+28V Glideslope Inhibit Discrete	Inhibit => "28 Volts Glideslope Inhibit True" Not Inhibit => "28 Volts Glideslope Inhibit False"

6.6.13 Glideslope Cancel Discrete

Type: Supplied by a momentary actuated cockpit Glideslope mode manual inhibit switch.

Signal Status: Glideslope is canceled if Glideslope function is active

Fault monitoring: Activation of this input for more than 15 seconds will result in the 'Glideslope Cancel Invalid' fault which will cause a GPW INOP indication. Typically the Glideslope cancel can only be selected below 2000 feet AGL.

	Level 6 Audio readout
Glideslope Cancel Discrete	Cancel => "Glideslope Canceled" Normal => "Glideslope Enabled"

6.6.14 Decision Height Discrete

Type: Decision Height Bug switch

Signal Status: Less than Decision Height or Greater than Decision Height

	Level 6 Audio readout
DH Discrete	Less Than DH => "Below DH" Greater Than DH => "Above DH"

6.6.15 Mode 6 Low Volume Discrete

Type: Mode 6 low volume select switch

Signal Status: Low Volume Select or Normal Volume

"Low Volume" in this case refers to the -6db volume level used during Self-Test. "Normal Volume" refers to the audio output level selected per Category 14 (5.3.14).

	Level 6 Audio readout
Mode 6 Low Volume Discrete	Low Volume => "Mode 6 Low Volume" Normal => "Mode 6 Normal Volume"

6.6.16 GND Audio Inhibit Discrete

Type: Analog discrete input from a flight deck mounted switch

Signal Status: Audio Suppress enabled or disabled/All Modes Inhibit enable or disable

Fault Monitoring: Activation of this input will result in the "External EGPWS Inhibited".

	Level 6 Audio readout
GND Audio Inhibit Discrete	Inhibit => "Audio Inhibit" Not Inhibit => "Audio Not Inhibit"

6.6.17 +28V Audio Inhibit Discrete

Type: Analog discrete input from a flight deck mounted switch

Signal Status: Audio Suppress enabled or disabled/All Modes Inhibit enable or disable

Fault Monitoring: Activation of this input will result in the "External EGPWS Inhibited".

	Level 6 Audio readout
+28V Audio Inhibit Discrete	Inhibit => "28 Volts Audio Inhibit" Not Inhibit => "28 Volts Audio Not Inhibit"

6.6.18 Display Select Discrete #1

Type: Supplied by momentarily actuated cockpit manual switch.

Signal Status: Terrain Awareness Display (TAD) activated if not active or TAD canceled if currently active.

	Level 6 Audio readout
Display Select Discrete #1	True => "Display Discrete 1 True" False => "Display Discrete 1 False"

6.6.19 Display Select Discrete #2

Type: Supplied by momentarily actuated cockpit manual switch.

Signal Status: Terrain Awareness Display (TAD) activated if not active or TAD canceled if currently active.

	Level 6 Audio readout
Display Select Discrete #2	True => "Display Discrete 2 True" False => "Display Discrete 2 False"

6.6.20 Terrain Awareness & TCF Inhibit Discrete

Type: Supplied by an alternate action (latching) and self indicating cockpit switch for inhibit of Terrain Awareness & TCF functions

Signal Status: Terrain Awareness & TCF Inhibit or Not Inhibit

"Terrain Inhibited" will be enunciated during cockpit Self Test if inhibited.

	Level 6 Audio readout
Terrain Awareness & TCF Inhibit	Inhibit => "Terrain Off" Not Inhibit => "Terrain On"

6.6.21 Autopilot Engaged Discrete #1

An Autopilot Engaged Discrete may be used by EGPWS for the Bank Angle mode computation.

Type: Discrete from the Autopilot system.

Signal Status: Engaged or Not Engaged

	Level 6 Audio readout
Autopilot Engaged Discrete	Engaged => "Autopilot On" Not Engaged => "Autopilot Off"

6.6.22 Barometric Altitude Validity Discrete

A Barometric Altitude Validity Discretes may be used by EGPWS for the barometric rate sensor.

Type: Validity from barometric altitude sensor.

Signal Status: Valid or Invalid

	Level 6 Audio readout
Barometric Altitude Validity Discrete	Valid => "Altitude Valid" Invalid => "Altitude Invalid"

6.6.23 Magnetic Heading Validity Discrete

A Magnetic Heading Validity Discrete may be used by EGPWS for the Mag Heading sensor.

Type: Validity from Magnetic Heading sensor.

Signal Status: Valid or Invalid

	Level 6 Audio readout
Magnetic Heading Validity Discrete	Valid => "Magnetic Heading Valid" Invalid => "Magnetic Heading Invalid"

6.6.24 Attitude Validity Discrete

A Attitude Validity Discretes may be used by EGPWS for the Pitch and Roll signals.

Type: Validity from vertical gyro or attitude computer.

Signal Status: Valid or Invalid

	Level 6 Audio readout
Attitude Validity Discrete	Valid => "Attitude Valid" Invalid => "Attitude Invalid"

6.6.25 Steep Approach Discrete #2

Activates steep approach biasing if Steep Approach Enabled is true (see Category 7, Section 5.3.7).

Alt. Action Type: Supplied by an alternate action (latching) and self indicating cockpit switch .

Momentary Type: Supplied by a momentary (non-latching) switch with switch lamp driven by EGPWS Steep Approach Discrete output.

Signal Status: Steep Approach Selected or not Selected

Fault monitoring: None if Steep Approach Enabled is false. EGPWS Self-Test is inhibited if Steep Approach Enabled is true and Steep Approach Discrete #2 is "Selected" on the ground. For momentary switch inputs, activation of this switch input for more than 15 seconds will result in the "Steep Approach Invalid" fault which will cause a GPWS INOP indication.

	Level 6 Audio readout
Steep Approach Discrete #2	Selected => "Steep Approach Selected" Not Selected => "Steep Approach Not Selected"

6.6.26 Timed Audio Inhibit Discrete

Type: Supplied by a momentary action (internally latching) and indicating cockpit switch for inhibit of audio functions.

Signal Status: Audio Inhibit or not Inhibit

Fault monitoring: The Audio Inhibit function does not inhibit Self Test, therefore, "Timed Audio Inhibited Fault" will be enunciated during cockpit Level 2 Self Test.

	Level 6 Audio readout
Timed Audio Inhibit Discrete	Selected => "Timed Audio Inhibit" Not Selected => "Timed Audio Not Inhibit"

6.6.27 GPWS Inhibit Discrete

This discrete inhibits all audio and visual except for Windshear, Terrain Awareness and TCF.

Type: Supplied by an alternate action (latching) and self indicating cockpit switch.

Signal Status: GPWS enabled or disabled

Fault monitoring: Activation of this input for more than 5 seconds will result in the 'GPWS Inhibit' fault which will cause a GPWS INOP indication.

	Level 6 Audio readout
GPWS Inhibit Discrete	Selected => "GPWS Inhibit" Not Selected => "GPWS Not Inhibit"

6.6.28 Localizer Validity Discrete #1

A Localizer Validity discrete may be used by the EGPWS for localizer input from an ARINC 547 Nav Receiver.

Type: Validity from ARINC 547 Nav Receiver

Signal Status: Valid or Invalid

	Level 6 Audio readout
Localizer Validity Discrete #1	Valid => "Localizer 1 Valid" Invalid => "Localizer 1 Invalid"

7 OUTPUT DATA DEFINITION

7.1 ARINC 429 Output Data

The MK VI and VIII EGPWC provides one or two ARINC 429 low or high-speed output channels per section 5.3.6.3. The output consist of internal parameters that can be used for display selection, test purposes, and discrete outputs that can be used for discrete outputs, test and recording. During LRU Self-Test the SSM of each output label is set to the Functional Test status code. The output types can be summarized as follows.

1) Internal data: Some internal data is output for test purposes only such as Radio Altitude, Computed Airspeed, Geometric Altitude, etc.

2) Alert status: Each type of Voice and Lamp activity is mapped to a specific label/BIT. This can be used to provide inputs to display systems and flight recorders.

3) Internal Mode status: Various internal EGPWC mode logic is transmitted for test purposes.

4) Terrain Display messages for TAD cockpit integration.

The ARINC 429 bus transmits both discrete and BNR labels. In the event of catastrophic computer failure, or 429 transmitter failure, outputs will not be transmitted. During Self-Test, the SSM will be set to functional test on all outputs (bits 31/30 = 1/0). During all other conditions of computer or input failures, the 429 outputs will continue to be transmitted as actual valid data. For valid status the standard discrete SSM format is used (00) except for data indicated as being in 2's complement format where the standard BNR SSM format is used (11). The SDI bits (9/10) will always be set to "00".

Note: Label 067 includes an indication of parameter inaccuracy that is not tied to the above discussion of SSM settings.

The following table identifies those outputs that are transmitted. Note that the outputs are segregated by functional groups. Refer to the subsections following the table for specific format information for each output. The subsections are in the same order as the table.

TABLE 7.1-1: ARINC 429 DITS OUTPUTS

OPERATIONAL OUTPUTS				
LABEL	**Reference**	**NAME**	**DESCRIPTION**	**NOTES**
		DISCRETE OUTPUT WORDS		
270	7.1.1.1	EGPWS ALERT DISCRETE #1	EGPWS ALERT INDICATION	1
271	7.1.1.2	EGPWC LOGIC DISCRETES	INTERNAL LOGIC BOOLEANS	1
272	7.1.1.3	MODE 6 CALLOUTS DISCRETE #1	MODE 6 CALLOUT INDICATION #1	1
273	7.1.1.4	MODE 6 CALLOUTS DISCRETE #2	MODE 6 CALLOUT INDICATION #2	1
274	7.1.1.5	EGPWS ALERT DISCRETE #2	LAMP OUTPUT WORD	1
300	7.1.1.6	EGPWC ALERT DISCRETE #3	INOP INDICATIONS OF THE MK VI AND VIII EGPWC FUNCTIONS	1
		INTERNAL DATA OUTPUTS	The internal data output labels are lowest priority.	
135	7.1.2.1	GEOMETRIC ALTITUDE VFOM	COMPUTED GEOMETRIC ALTITUDE VFOM	5
164	7.1.2.2	TERRAIN CLEARANCE	RADIO ALTITUDE FILTERED BY MK VI AND VIII EGPWC	1
261	7.1.2.3	GEOMETRIC ALTITUDE	COMPUTED GEOMETRIC ALTITUDE	5
067	7.1.2.4	COMPUTED TERRAIN CLEARANCE	TERRAIN CLEARANCE COMPUTED BY EGPWS	5,6
310	7.1.2.5	LATITUDE	PRESENT POSITION EGPWS SELECTED LATITUDE	5,
311	7.1.2.6	LONGITUDE	PRESENT POSITION EGPWS SELECTED LONGITUDE	5,
223	7.1.2.7	BODY ANGLE OF ATTACK – RIGHT	COMPUTED BODY ANGLE OF ATTACK – RIGHT VANE	9
224	7.1.2.8	BODY ANGLE OF ATTACK – LEFT	COMPUTED BODY ANGLE OF ATTACK – LEFT VANE	9
242	7.1.2.9	CORRECTED AIRSPEED	COMPUTED CORRECTED AIRSPEED	9
331	7.1.2.10	WINDSHEAR WARNING THRESHOLD	WINDSHEAR WARNING THRESHOLD COMPUTED BY EGPWS	9
332	7.1.2.11	CORRECTED LONGITUDINAL ACCELERATION	COMPUTED CORRECTED LONGITUDINAL ACCELERATION	9
362	7.1.2.12	RAW TOTAL SHEAR	RAW TOTAL SHEAR COMPUTED BY EGPWS	9
364	7.1.2.13	CORRECTED NORMAL ACCELERATION	COMPUTED CORRECTED NORMAL ACCELERATION	9
375	7.1.2.14	CORRECTED FLIGHT PATH ANGLE	COMPUTED CORRECTED FLIGHT PATH ANGLE	9
376	7.1.2.15	SCALED TOTAL SHEAR	SCALED TOTAL SHEAR COMPUTED BY EGPWS	9
		TERRAIN DISPLAY OUTPUTS		
050	7.1.3.1	DISPLAYED RANGE	TERRAIN DISPLAY #1 AND #2 RANGE	2,4
051	7.1.3.2	TERRAIN DISPLAY STATUS WORD	TERRAIN DISPLAY STATUS INFORMATION	2,4
052	7.1.3.3	MESSAGE WORD #1	COLOR OF DISPLAY MESSAGE	2,4
053	7.1.3.4	MESSAGE WORD #2	FIRST TWO CHARACTERS OF DISPLAY MESSAGE	2,4
054	7.1.3.5	MESSAGE WORD #3	SECOND TWO CHARACTERS OF DISPLAY MESSAGE	2,4
055	7.1.3.6	MESSAGE WORD #4	LAST TWO CHARACTERS OF DISPLAY MESSAGE	2,4
		EQUIPMENT ID		
377	7.1.4.1	EQUIPMENT IDENTIFICATION	PROVIDES ARINC 429 DEFINED EQUIPMENT ID NO. (023)	3
		FAULT SUMMARY WORDS		
350	7.1.5.1	FAULT DIAGNOSTIC WORD #1	PROVIDES FAULT STATUS	5
351	7.1.5.2	FAULT DIAGNOSTIC WORD #2	PROVIDES FAULT STATUS	5
355	7.1.5.3	FAULT DIAGNOSTIC WORD #3	PROVIDES FAULT STATUS	5
		PEAKS ELEVATION BINARY		
011	7.1.6.1	PEAKS UPPER ELEVATION	UPPER ELEVATION VALUE AND COLOR	6,7,8
012	7.1.6.2	PEAKS LOWER ELEVATION	LOWER ELEVATION VALUE AND COLOR	6,7,8

NOTES:
1) Update rate 100 ms ± 10%
2) Update rate 200 ms ± 10%
3) Update rate 500 ms ± 10%
4) Transmitted only if Terrain Awareness function enabled
5) Update rate 1000 ms ± 10%
6) NCD and Failure Warning Indications Provided
7) Transmitted only if Peaks enabled
8) Update rate 500 ms ± 10% for each SDI
9) Update rate 100 ms ± 20% (Labels only used for testing)

7.1.1 Discrete Output Words

The discrete output words transmit the status of all MK VI, and VIII EGPWC discrete and audio outputs. Label 274 is typically used to drive EFIS and/or EICAS displays. The other discrete labels are typically only used for flight recording and test purposes.

7.1.1.1 EGPWS Alert Discrete #1 (270)

Data:	Discrete
Label:	270 Octal
Significant Bits:	(see table below)
Sign Bit:	N/A
Transmit Interval:	100 msec ± 10%

Bit No.	ASSIGNED WARNING MESSAGE (1 = voice on)
11	SINKRATE-PAUSE-SINKRATE
12	PULL UP
13	TERRAIN OR TERRAIN-TERRAIN
14	DONT SINK-PAUSE-DONT SINK
15	TOO LOW GEAR
16	TOO LOW FLAPS
17	TOO LOW TERRAIN
18	GLIDESLOPE
19	MINIMUMS MINIMUMS
* 20	TERRAIN PULLUP
21	CAUTION TERRAIN
* 22	TERRAIN AHEAD PULL UP or OBSTACLE AHEAD PULL UP
* 23	(SIREN) WINDSHEAR WINDSHEAR WINDSHEAR
* 24	CAUTION WINDSHEAR
* 25	ENGINE FAIL
* 26	VEE ONE
* 27	CAUTION TERRAIN or TERRAIN AHEAD
28	CAUTION OBSTACLE or OBSTACLE AHEAD
29	OBSTACLE OBSTACLE

NOTE (*): Bits 23 through 26 will be set to zero when unsupported. Bit 22, This bit is used for the alternate terrain and obstacle warning voice message. The basic terrain warning message is mapped to bits 13 and 12 and obstacle warning voice mapped to bits 29 and 12. Bits 23 & 24, are supported by MKVIII EGPWS only, provided that WS is included in configuration. Bits 20, 25 & 26, are Not supported. Bit 27, is the alternate Terrain Caution voice.

7.1.1.2 EGPWC Logic Discretes (271)

Data:	Discrete
Label:	271 Octal
Significant Bits:	(see table below)
Sign Bit:	N/A
Transmit Interval:	100 msec ± 10%

BIT No.	DEFINITION
* 11	GPW INHIBIT (by Windshear)
* 12	WS ALERT INHIBIT
13	TERRAIN CLEARANCE FLOOR ALERT
14	ENVELOPE MOD IN PROGRESS
15	ENVELOPE MOD SNAPSHOT LATCH SET
* 16	WINDSHEAR TAKE-OFF
* 17	WINDSHEAR MASTER VALID
18	TAKE-OFF MODE
19	MODE 1 SINKRATE
20	MODE 1 PULL UP
21	MODE 2 TERRAIN
22	MODE 2 PULL UP
23	MODE 3 VISUAL
24	MODE 4 VISUAL
25	MODE 5 VISUAL
* 26	MODE 7 VISUAL ALERT
27	TERRAIN AWARENESS CAUTION
28	TERRAIN AWARENESS WARNING
* 29	MODE 7 VISUAL WARNING

NOTE (*): Bits 11, 12, 16, 17, 26 and 29 will be set to zero when Not Supported. Supported by MKVIII EGPWS only, provided that WS is included in configuration.

7.1.1.3 Mode 6 Callouts Discrete #1 (272)

Data:	Discrete
Label:	272 Octal
Significant Bits:	(see table below)
Sign Bit:	N/A
Transmit Interval:	100 msec ± 10%

BIT NO	WARNING MESSAGE (1 = voice on)
11	MINIMUMS
* 12	DECISION HEIGHT
* 13	APPROACHING MINIMUMS
* 14	APPROACHING DECISION HEIGHT
* 15	ZERO (Not supported)
16	TEN
17	TWENTY
18	THIRTY
19	FORTY
20	FIFTY
* 21	SIXTY
* 22	EIGHTY
23	ONE HUNDRED
24	TWO HUNDRED
25	THREE HUNDRED
* 26	MINIMUM
* 27	PLUS HUNDRED
* 28	DECIDE
* 29	FIFTY ABOVE

NOTE (*): Bits 12 - 15, 21, 22 and 26 - 29 will be set to zero, Not supported.

7.1.1.4 Mode 6 Callouts Discrete #2 (273)

Data:	Discrete
Label:	273 Octal
Significant Bits:	(see table below)
Sign Bit:	N/A
Transmit Interval:	100 msec ± 10%

BIT NO	DEFINITION (1 = voice on)
11	FOUR HUNDRED
12	FIVE HUNDRED (NORMAL, SMART or ABOVE FIELD)
13	ONE THOUSAND
* 14	700 HZ TONE
* 15	960 HZ TONE
* 16	1400 HZ TONE
* 17	2800 HZ TONE
18	BANK ANGLE (pause) BANK ANGLE
* 19	THIRTY FIVE
* 20	TWENTY FIVE HUNDRED
* 21	RADIO ALTIMETER
* 22	FIVE
23	FIVE HUNDRED ABOVE (ABOVE FIELD)
* 24	(SPARE)
* 25	(SPARE)
* 26	(SPARE)
* 27	FLAPS (pause) FLAPS
* 28	AUTOPILOT
* 29	SPEED BRAKE (pause) SPEED BRAKE

NOTE (*): Bits 14 - 17, 19 – 22, and 24 - 29 will be set to zero. Not supported.

7.1.1.5 EGPWS Alert Discrete #2 (274)

Data:		Discrete
Label:		274 Octal
Significant Bits:		(see table below)
Sign Bit:		N/A
Transmit Interval:		50 to 100 msec
Bit No.	ASSOCIATED DISCRETE PIN	DEFINITION (1 = ON)
11	J1-76	(TYPICALLY GLIDESLOPE CANCEL)
12	J1-77	GPWS ALERT
13	J1-78	GPWS WARNING
14	----	GPWS INOP
* 15	----	WINDSHEAR WARNING
16	J1-69	AUDIO ON
* 17	----	WINDSHEAR INOP
* 18	----	WINDSHEAR CAUTION
* 19	----	CALLOUTS INOP
* 20	----	VEE ONE INOP
* 21	----	ENGINE FAIL INOP
22	----	TERRAIN AWARENESS WARNING or OBSTACLE AWARENESS WARNING
23	----	TERRAIN AWARENESS CAUTION or OBSTACLE AWARENESS CAUTION
24	----	TERRAIN AWARENESS INOP
25	FRONT PANEL LED	EXTERNAL FAULT
26	FRONT PANEL LED	COMPUTER FAIL
27	----	TERRAIN AWARENESS NOT AVAILABLE
28	J1-54	TERRAIN DISPLAY DISCRETE #1
* 29	J1-49	TERRAIN DISPLAY DISCRETE #2

NOTE (*): Bits 15, 17- 21 and 29 will be set to zero when Not Supported. Bits 15, 17, & 18 are supported by MKVIII EGPWS only, provided that WS is included in configuration. Bits 20 & 21 are Not supported.

7.1.1.6 EGPWC Alert Discrete #3 (300)

Data:	Discrete
Label:	300 Octal
Significant Bits:	(see table below)
Sign Bit:	N/A
Transmit Interval:	50 to 100 msec

BIT No.	DEFINITION
11	MODES 1-4 INOP
12	MODE 5 INOP
13	MODE 6 INOP
14	BANK ANGLE INOP
* 15	MODE 7 INOP
16	TERRAIN CLEARANCE FLOOR INOP or RUNWAY FIELD CLEARANCE FLOOR INOP
17	TERRAIN AWARENESS INOP
18	ENVELOPE MODULATION INOP
* 19	SPEED BRAKE INHIBIT
* 20	SPEED BRAKE ALERT
* 21	TCAS INHIBIT
* 22	(SPARE)
* 23	(SPARE)
* 24	(SPARE)
* 25	(SPARE)
* 26	(SPARE)
* 27	FLAP OVERRIDE LATCH
28	OBSTACLE AWARENESS CAUTION
29	OBSTACLE AWARENESS WARNING

NOTE (*): Bits 15 and 19 - 27 will be set to zero when Not Supported. Bit 15 is supported by MKVIII EGPWS only, provided that WS is included in configuration. Bits 19 - 27 are Not supported.

7.1.2 Internal Data Outputs

Internal data outputs are only used for test purposes. Tables 7.1.2.1 through 7.1.2.6 are available for both MKVI and MKVIII EGPWS. Tables 7.1.2.7 through 7.1.2.15 are are only output when the Honeywell Windshear Algorithm is enabled (available only on the MKVIII EGPWS) and are only used for test purposes.

7.1.2.1 Geometric Altitude VFOM (135)

LABEL (Octal) 135	Units: Feet	Max. Range: 32,768 Ft	Approx. LSB: 0.125 Foot
Data Bits: 11 to 28 = 18	+ = N/A	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (msec): 1000 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.2 Terrain Clearance (164)

LABEL (Octal) 164	Units: Feet	Max. Range: ± 8,192 Feet	Approx. LSB: 1.0 Foot
Data Bits: 16 to 28 = 13	+ = Above Ground Level (AGL)	Sign Bit: 29	Pad Bits: 11 to 15
Transmit Interval (mSec): 100 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.3 Geometric Altitude (261)

LABEL (Octal) 261	Units: Feet	Max. Range: ± 131,072 Ft	Approx. LSB: 0.125 Foot
Data Bits: 9 to 28 = 20	+ = Above Sea Level (ASL)	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (msec): 1000 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: N/A

7.1.2.4 Computed Terrain Clearance (067)

LABEL (Octal) 067	Units: Feet	Max. Range: ±131,072 Ft	Approx. LSB: 1.0 Foot
Data Bits: 12 to 28 = 17	+ = Above Ground Level (AGL)	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (msec): 1000 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: N/A

Bit	Definitions
11	Set to 1 when Computed Terrain Clearance low accuracy is indicated
12 -28	Computed Terrain Clearance

7.1.2.5 Latitude – Selected EGPWS (310)

LABEL (Octal) 310	Units: Degrees	Max. Range: ± 180 Degrees	LSB: 0.00017166137695
Data Bits: 9 to 28 = 20	+ = North	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (mSec): 1000 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: used for data

7.1.2.6 Longitude – Selected EGPWS (311)

LABEL (Octal) 311	Units: Degrees	Max. Range: ± 180 Degrees	LSB: 0.00017166137695
Data Bits: 9 to 28 = 20	+ = East	Sign Bit: 29	Pad Bits: N/A
Transmit Interval (mSec): 1000 ± 10%	Data Type: 2's Compliment Binary		SDI Bits: used for data

7.1.2.7 Body Angle of Attack—Right (223) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 223	Units: Degrees/180	Max. Range: ± 180 Degrees	Approx. LSB: 0.00549 Degree
Data Bits: 14 to 28 = 15	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.8 Body Angle of Attack—Left (224) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 224	Units: Degrees/180	Max. Range: ± 180 Degrees	Approx. LSB: 0.00549 Degree
Data Bits: 14 to 28 = 15	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.9 Corrected Airspeed (242) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 242	Units: Feet/Second	Max. Range: 2048 Ft/Sec	Approx. LSB: 0.0625 Ft/Sec
Data Bits: 14 to 28 = 15	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.10 Windshear Warning Threshold (331) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 331	Units: g's	Max. Range: 0.0 40 -4.0 g's	Approx. LSB: 0.00012207 g's
Data Bits: 14 to 28 = 15	+ = N/A (always negative)	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.11 Corrected Longitudinal Acceleration (332) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 332	Units: g's	Max. Range: ± 4.0 g's	Approx. LSB: 0.00012207 g's
Data Bits: 14 to 28 = 15	+ = Forward	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

Note: Longitudinal Acceleration is corrected by Cosine of Body Angle of Attack.

7.1.2.12 Raw Total Shear (362) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 362	Units: g's	Max. Range: ± 4.0 g's	Approx. LSB: 0.00012207 g's
Data Bits: 14 to 28 = 15	+ = Headwind/Updraft	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.13 Corrected Normal Acceleration (364) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 364	Units: g's	Max. Range: ± 4.0 g's	Approx. LSB: 0.00012207 g's
Data Bits: 14 to 28 = 15	+ = Up	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

Note: Normal Acceleration is corrected by Sine of Body Angle of Attack.

7.1.2.14 Computed Flight Path Angle (375) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 375	Units: Radians	Max. Range: ± 4.0 Radians	Approx. LSB: 0.00012207 Radians
Data Bits: 14 to 28 = 15	+ = Nose Up	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.2.15 Scaled Total Shear (376) – MKVIII EGPWS w/ Windshear only

LABEL (Octal) 376	Units: g's	Max. Range: ± 4.0 g's	Approx. LSB: 0.00012207 g's
Data Bits: 14 to 28 = 15	+ = Headwind/Updraft	Sign Bit: 29	Pad Bits: 11 to 13
Transmit Interval (mSec): 100 ± 20%	Data Type: 2's Compliment Binary		SDI Bits: 9, 10

7.1.3 Terrain Display Outputs

The following ARINC 429 outputs support the Terrain Display function.

7.1.3.1 Displayed Range (050)

Data: Discrete	Label (Octal): 050	Transmit Interval: 200 msec ± 10%

BIT NO	DEFINITION
11 – 14	TERRAIN DISPLAY RANGE #1 (0.5 to 2000 NM format)
15 – 18	TERRAIN DISPLAY RANGE #2 (0.5 to 2000 NM format)
19 - 29	UNDEFINED

NOTE: Bits contain left and right side Terrain Display Ranges (0.5 to 2000 NM, format as follows)

DISPLAY RANGE BIT ASSIGNMENTS			
(Bits 14-11) & (Bits 18-15)	DEFINITION	(Bits 14-11) & (Bits 18-15)	DEFINITION
0000	0.5 NM	1000	150 NM
0001	1.0 NM	1001	200 NM
0010	2.5 NM	1010	300 NM
0011	5.0 NM	1011	500 NM
0100	10 NM	1100	1000 NM
0101	25 NM	1101	2000 NM
0110	50 NM	1110	600 NM
0111	100 NM	1111	1200 NM

7.1.3.2 Terrain Display Status Word (051)

Data: Discrete	Label (Octal): 051	Transmit Interval: 200 msec ± 10%

BIT NO	DEFINITION
11	POP UP BOOLEAN #1
12	POP UP BOOLEAN #2
13	TERRAIN DISPLAY VALID (cleared when TERRAIN AWARENESS NOT AVAILABLE or TERRAIN AWARENESS INOP are true)
14	SPARE
15	SPARE
16	FLAP OVERRIDE (Only from ARINC 429 FWC discrete word label 171, not from discrete switch)
17	TERRAIN AWARENESS & TCF INHIBIT
18	SPARE
19	SPARE
20	SPARE
21	SPARE
22	SPARE
23	SPARE
24	SPARE
25	SPARE
26	TERRAIN DISPLAY CAUTION
27	TERRAIN DISPLAY WARNING
28	STEEP APPROACH ACTIVATED
29	SPARE

7.1.3.3 Message Word #1 (052)

This label contains the color to be displayed on the 6-character terrain display window.

Data: Discrete		Label (Octal): 052	Transmit Interval: 200 msec ± 10%	
BIT NO	DEFINITION		BIT Coding	COLOR Code (Hex)
9 - 10	SDI (00)			
11	Spare			
12	Spare			
13	Spare			
14	Spare			
15	Spare			
16	Spare			
17	Spare			
18	Spare			
19	Spare			
20	Spare			
21	Spare			
22	Spare			
23	Character Color		LSB (7 bit Hex)	000 0001 = **Red**
24	Character Color			000 0010 = **Amber**
25	Character Color			000 0011 = **Yellow**
26	Character Color			000 0100 = **Green**
27	Character Color			000 0101 = **Cyan**
28	Character Color			000 0110 = **Magenta**
29	Character Color		MSB (7 bit Hex)	000 0111 = **White**

7.1.3.4 Message Word #2 (053)

This label contains the first 2 characters to be displayed on the 6-character terrain display window.

Data: Discrete		Label (Octal): 053	Transmit Interval: 200 msec ± 10%		
BIT NO	DEFINITION		BIT Coding	TEXT Code (Hex)	TEXT Code (Hex)
9,10	SDI (00)				
11	Spare			20 = (space)	30 = **0**
12	Spare			21 = **!**	31 = **1**
13	Spare			22 = **“**	32 = **2**
14	Spare			23 = **#**	33 = **3**
15	Spare			24 = **%**	34 = **4**
16	Character Code - Left Most of Set 1 of 6		LSB (7 bit Hex)	25 = **$**	35 = **5**
17	Character Code - Left Most of Set 1 of 6			26 = **&**	36 = **6**
18	Character Code - Left Most of Set 1 of 6			27 = **‘**	37 = **7**
19	Character Code - Left Most of Set 1 of 6			28 = **(**	38 = **8**
20	Character Code - Left Most of Set 1 of 6			29 = **)**	39 = **9**
21	Character Code - Left Most of Set 1 of 6			2A = *****	3A = **:**
22	Character Code - Left Most of Set 1 of 6		MSB (7 bit Hex)	2B = **+**	3B = **;**
23	Character Code - Next Most of Set 2 of 6		LSB (7 bit Hex)	2C = **,**	3C = **<**
24	Character Code - Next Most of Set 2 of 6			2D = **-**	3D = **=**
25	Character Code - Next Most of Set 2 of 6			2E = **.**	3E = **>**
26	Character Code - Next Most of Set 2 of 6			2F = **/**	3F = **?**
27	Character Code - Next Most of Set 2 of 6				Continued at
28	Character Code - Next Most of Set 2 of 6				LABEL 054 Below
29	Character Code - Next Most of Set 2 of 6		MSB (7 bit Hex)		

7.1.3.5 Message Word #3 (054)

This label contains the second 2 characters to be displayed on the 6 character terrain display window.

Data: Discrete		Label (Octal): 054	Transmit Interval: 200 msec ± 10%		
BIT NO	DEFINITION		BIT Coding	TEXT Code (Hex)	TEXT Code (Hex)
9,10	SDI (00)				
11	Spare			Continued from	
12	Spare			LABEL 053 Above	
13	Spare				50 = **P**
14	Spare			40 = ° (Deg Sign)	51 = **Q**
15	Spare			41 = **A**	52 = **R**
16	Character Code - Next Most of Set 3 of 6		LSB (7 bit Hex)	42 = **B**	53 = **S**
17	Character Code - Next Most of Set 3 of 6			43 = **C**	54 = **T**
18	Character Code - Next Most of Set 3 of 6			44 = **D**	55 = **U**
19	Character Code - Next Most of Set 3 of 6			45 = **E**	56 = **V**
20	Character Code - Next Most of Set 3 of 6			46 = **F**	57 = **W**
21	Character Code - Next Most of Set 3 of 6			47 = **G**	58 = **X**
22	Character Code - Next Most of Set 3 of 6		MSB (7 bit Hex)	48 = **H**	59 = **Y**
23	Character Code - Next Most of Set 4 of 6		LSB (7 bit Hex)	49 = **I**	5A = **Z**
24	Character Code - Next Most of Set 4 of 6			4A = **J**	5B = **[**
25	Character Code - Next Most of Set 4 of 6			4B = **K**	5C = \
26	Character Code - Next Most of Set 4 of 6			4C = **L**	5D = **]**
27	Character Code - Next Most of Set 4 of 6			4D = **M**	5E = ^
28	Character Code - Next Most of Set 4 of 6			4E = **N**	5F = _ (underscore)
29	Character Code - Next Most of Set 4 of 6		MSB (7 bit Hex)	4F = **O**	00 = (Null)

NOTE: Text code for degree sign is non-standard ASCII for 40_{HEX}.

7.1.3.6 Message Word #4 (055)

This label contains the last 2 characters to be displayed on the 6-character terrain display window.

Data: Discrete		Label (Octal): 055	Transmit Interval: 200 msec ± 10%		
BIT NO	DEFINITION		BIT Coding		
9,10	SDI (00)				
11	Spare				
12	Spare				
13	Spare				
14	Spare				
15	Spare				
16	Character Code - Next Most of Set 5 of 6		LSB (7 bit Hex)		
17	Character Code - Next Most of Set 5 of 6				
18	Character Code - Next Most of Set 5 of 6				
19	Character Code - Next Most of Set 5 of 6				
20	Character Code - Next Most of Set 5 of 6				
21	Character Code - Next Most of Set 5 of 6				
22	Character Code - Next Most of Set 5 of 6		MSB (7 bit Hex)		
23	Character Code - Right Most of Set 6 of 6		LSB (7 bit Hex)		
24	Character Code - Right Most of Set 6 of 6				
25	Character Code - Right Most of Set 6 of 6				
26	Character Code - Right Most of Set 6 of 6				
27	Character Code - Right Most of Set 6 of 6				
28	Character Code - Right Most of Set 6 of 6				
29	Character Code - Right Most of Set 6 of 6		MSB (7 bit Hex)		

7.1.4 Equipment Identification

Provides equipment identification for maintenance reporting.

7.1.4.1 Equipment Identification Word (377)

Data: Discrete	Label (Octal): 377	Transmit Interval: 500 msec ± 10%

BIT NO	DEFINITION
11 - 22	ID Code Equipment ID code = 023 Hex for EGPWC.
23 - 29	Spare (set to zero)

7.1.5 Fault Summary Words (for Proline 4/21)

Provides fault diagnosis information.

7.1.5.1 Fault Diagnostic Word #1 (350)

Data: Discrete	Label (Octal): 350	Transmit Interval: 1000 msec ± 10%

BIT NO	DEFINITION (1= Failed)	
11	ARINC 429 INPUT #1 FAILED	
12	ARINC 429 INPUT #2 FAILED	
13	ARINC 429 INPUT #3 FAILED	
14	ARINC 429 INPUT #4 FAILED	
15	ARINC 429 INPUT #5 FAILED	
16	ARINC 429 INPUT #6 FAILED	
17	ARINC 429 INPUT #7 FAILED	
18	ARINC 429 INPUT #8 FAILED	
19	ANALOG DC INPUT #1 FAILED	(future)
20	ANALOG DC INPUT #2 FAILED	(future)
21	ANALOG DC INPUT #3 FAILED	(future)
22	ANALOG DC INPUT #4 FAILED	(future)
23	ANALOG DC INPUT #5 FAILED	(future)
24	ANALOG DC INPUT #6 FAILED	(future)
25	ANALOG DC INPUT #7 FAILED	(future)
26	ANALOG SYNCHRO INPUT #1 FAILED	(future)
27	ANALOG SYNCHRO INPUT #2 FAILED	(future)
28	ANALOG SYNCHRO INPUT #3 FAILED	(future)
29	ANALOG SYNCHRO INPUT #4 FAILED	(future)

7.1.5.2 Fault Diagnostic Word #2 (351)

Data: Discrete	Label (Octal): 351	Transmit Interval: 1000 msec ± 10%

BIT NO	DEFINITION (1= Failed)	
11	ANALOG SYNCHRO INPUT #5 FAILED	(future)
12	AC REFERENCE #1 FAILED	(future)
13	AC REFERENCE #2 FAILED	(future)
14	DC REFERENCE #1 FAILED	(future)
15	ADC RS232/RS422 INPUT FAILED	(future)
16	ADC RS232/RS422 OUTPUT FAILED	(future)
17	GPS RS232/RS422 INPUT FAILED	(future)
18	GPS RS232/RS422 OUTPUT FAILED	(future)
19	SUPPORT TASK FAILED	
20	NVM FAULT	
21	WATCHDOG TIMER FAULT	
22	A/D FAIL FAULT	
23	VOICE FAIL	
24	DITS OUTPUT FAIL	
25	TERRAIN DATABASE FAULT	
26	FLASH FILE SYSTEM WRITE FAULT	
27	DITS INPUT FAIL	
28	VOICE DATABASE FAULT	
29	SYSTEM OR MODE TASK FAULT	

7.1.5.3 Fault Diagnostic Word #3 (355)

Data: Discrete	Label (Octal): 355	Transmit Interval: 1000 msec ± 10%

BIT NO	DEFINITION (1= Failed)
11	ENVELOPE MODULATION DATABASE FAULT
12	EXCESSIVE WATCHDOG TIMEOUTS FAILURE
13	AIRCRAFT DATABASE FAULT 'OR' CRC FAULT
14	IMAGE DSP FAULT
15	INTERNAL GPS FAULT
16	CONFIGURATION MODULE FAILED
17	GLIDESLOPE CANCEL DISCRETE FAILED
18	AUDIO INHIBIT DISCRETE INPUT FAILED
19	SELF TEST DISCRETE INPUT FAILED
20	FLAP INPUT FAILED
21	GEAR INPUT FAILED
22	Spare
23	Spare
24	Spare
25	Spare
26	Spare
27	Spare
28	Spare
29	Spare

7.1.6 Peak Binary Labels

The following ARINC 429 outputs are used to provide Peak Elevations and color information for integrated displays where the EFIS outputs stroke written Peaks Elevation information on the display. This label set consists of 2 labels containing upper and lower elevation, color, and display blanking data. Each label is transmitted with two different SDI values for the captain's and first officer's display values.

7.1.6.1 Peaks Upper Elevation (011)

Data: See Below	Label (Octal): 011	Transmit Interval: 500 msec ± 10%

BIT NO	DEFINITION								
9	SDI	0 Not Used		1 Captain		0 F/O		1 Not Used	
10	SDI	0		0		1		1	
11	COLOR BIT 1	0	1	0	1	0	1	0	1
12	COLOR BIT 2	0 Black	0 Green	1 Yellow	1 Red	0 Magenta	0 Blue	1 Cyan	1 White
13	COLOR BIT 3	0	0	0	0	1	1	1	1
14	BLANK PEAKS ELEVATION DISPLAY	0 Normal Display		1 Blank Display					
15	DASH PEAKS ELEVATION DISPLAY	0 Normal Display		1 Display Dashes					
16	SPARE								
17	SPARE								
18	SPARE								
19	SPARE								
20	100 Ft	NOTE: Elevation bits are additive; e.g., bits 20 & 21 = 1 indicates 300 Ft.		Upper Peaks Elevation					
21	200 Ft								
22	400 Ft								
23	800 Ft								
24	1600 Ft								
25	3200 Ft								
26	6400 Ft								
27	12800 Ft								
28	25600 Ft								
29	SIGN	0 = 0 (Plus)	1 = - 51200 Ft						
30	SSM	0 Failure		1 No Computed		0 Functional Test		1 Normal	
31	SSM	0 Warning		0 Data		1		1 Operation	
32	PARITY (Odd)								

7.1.6.2 Peaks Lower Elevation (012)

Data: See Below		Label (Octal): 012		Transmit Interval: 500 msec ± 10%									
BIT NO	DEFINITION												
9	SDI	0 Not Used		1 Captain		0 F/O		1 Not Used					
10	SDI	0		0		1		1					
11	COLOR BIT 1	0	1	0	1	0	1	0	1				
12	COLOR BIT 2	0 Black	0 Green	1 Yellow	1 Red	0 Magenta	0 Blue	1 Cyan	1 White				
13	COLOR BIT 3	0	0	0	0	1	1	1	1				
14	BLANK PEAKS ELEVATION DISPLAY			0 Normal Display		1 Blank Display							
15	DASH PEAKS ELEVATION DISPLAY			0 Normal Display		1 Display Dashes							
16	SPARE												
17	SPARE												
18	SPARE												
19	SPARE												
20	100 Ft	NOTE: Elevation bits are additive; e.g., bits 20 & 21 = 1 indicates 300 Ft.											
21	200 Ft												
22	400 Ft												
23	800 Ft												
24	1600 Ft												
25	3200 Ft												
26	6400 Ft												
27	12800 Ft												
28	25600 Ft												
29	SIGN	0 = 0 (Plus)		1 = - 51200 Ft									
30	SSM	0 Failure		1 No Computed		0 Functional Test		1 Normal					
31	SSM	0 Warning		0 Data		1		1 Operation					
32	PARITY (Odd)												

Lower Peaks Elevation

7.2 ARINC 708A Output

Two channels of ARINC 708A or KCPB (453) data is provided to drive terrain displays for installations that use the Terrain Awareness display function. Refer to document 060-4303-000, EGPWS Interface Methodology for further KCPB information. See Category 6 for more details on individual displays.

7.3 Audio Output

Mode computation outputs generally result in an audio voice alert unless inputs are invalid or one of the audio suppression discretes is active. The actual output message, or intended message during audio suppression, is sent to the alert lamp logic for proper output activation.

The audio outputs consist of an 8 ohm amplifier and a transformer isolated 600 ohm output. Additional automatic volume control lowers both outputs a fixed 6 dB below the nominal level on command. Refer to section 4.2.12 and Category 14 for information on volume levels.

Selectable sets of voice alert messages can be defined. Each set is selected by the Voice Menu option in Category 5.

7.4 Discrete Outputs

Outputs from the various alert mode computations are first processed to determine which lamp outputs to produce. All of the lamp outputs are driven by solid state switches to ground. These outputs can also be used as discrete drivers for other devices. All monitor lamp outputs are normally a steady state switch to ground. Various formats of discrete outputs can be provided as defined in Category 13.

7.4.1 Ground Proximity Alerts Discrete (Lamp) Outputs

Two Lamp formats are defined as a function of the selected I/O Discrete Type of section 5.3.13. For Lamp Format type 1, only Mode 5 “Glideslope” message will activate the alert lamp output (amber). All other messages will activate the warning lamp output (red). Note that Mode 6 does not activate any lamp outputs, only voices.

With Lamp Format 2, only the messages containing the phrase “Pull Up” will activate the warning lamp output (red). All other messages will activate the alert lamp output (amber).

The Glideslope Cancel Input Discrete controls the output of the Mode 5 “Glideslope” message. If the Glideslope Cancel Input Discrete is activated then the caution lamp (amber) and the voice annunciation will be inhibited for the Mode 5 “Glideslope” message.

7.4.2 Audio On Discrete

The Audio On discrete goes true whenever any voice message is being enunciated. It will stay true until the voice is completed. This output can be used to inhibit other audio systems (e.g., TCAS) during EGPWS audio or used to drive the audio key line input provided on some aircraft audio systems.

7.4.3 Monitor Discretes (GPWS INOP & Terrain INOP or Terrain Not Available)

The EGPWC produces two discrete monitor outputs. These discretes reflect the GPWS INOP and Terrain INOP / Terrain Not Available functions. These discretes activate with loss of EGPWC power. The status of these two discretes is also contained on an ARINC 429 output word.

Note: Some display systems provide one message area for both warning and associated INOP annunciation. There are conditions where GPW INOP and a GPWS warning can exist at the same time (e.g., Sinkrate warning can occur even if a Ground Airspeed input fault exists.) For these installations a configuration item *INOP & Warning Annunciation in Same Window* is provided which causes the INOP annunciation to extinguish whenever a valid warning annunciation is required. Various formats of monitor outputs can be provided as defined in Category 13.

7.4.4 Terrain Display Switching Discretes (WxR/EGPWS Display Select)

The EGPWC produces two discrete outputs for controlling the terrain display(s). They can be used either to control picture bus switching relay(s) or connected directly to the symbol generator(s).

7.4.5 Flap Override Discrete

The MK VI EGPWC Flap Override function can be selected by the pilot to desensitize the alert and warning modes. The Flap Override discrete output is active (Gnd) whenever the Flap Override has been selected and is typically used to drive a lamp.

7.4.6 Glideslope Cancel Discrete

The Glideslope Cancel discrete is active whenever Glideslope Cancel has been selected and is typically used to drive a lamp in the Glideslope Cancel switch.

7.4.7 Terrain / Obstacle Awareness Alert Discretes

Terrain Awareness provides discrete alert outputs for Terrain / Obstacle Cautions and Warnings. These outputs can drive cockpit lamps or act as discrete inputs to other aircraft systems.

7.4.7.1 Terrain / Obstacle Caution

Terrain and Obstacle Cautions can be configured to activate any of the discrete outputs. Depending on configuration, the Caution discretes will typically activate either the GPWS Warn Lamp, the GPSW Alert Lamp, or will drive their own output lamps.

7.4.7.2 Terrain / Obstacle Warning

Terrain and Obstacle Warnings can be configured to activate any of the discrete outputs. Depending on configuration, the Warning discretes will typically activate either the GPWS Warn Lamp or will drive their own output lamps.

7.4.8 Terrain Pop Up

The Terrain and Obstacle Caution and Warning are combined (Or'd) on one discrete to make a Terrain Pop Up indication for an integrated display system. The Pop Up discrete can be used by a display system to differentiate between a manual selection or one due to a Terrain/Obstacle Caution or Warning event.

7.4.9 Windshear INOP Monitor Discretes

The MK VIII EGPWC also produces an additional discrete monitor output for Windshear. This discrete reflects the WINDSHEAR INOP functions. The status of this discrete is also contained on an ARINC 429 output word.

7.4.10 Windshear Warning

The MK VIII EGPWC Windshear Warnings can be configured to activate any of the discrete outputs. Depending on configuration, the Warning discrete will typically drive its own output lamp or provide a discrete output to other aircraft systems.

7.4.11 Windshear Caution

The MK VIII EGPWC Windshear Cautions can be configured to activate any of the discrete outputs. Depending on configuration, the Caution discrete will typically drive its own output lamp or provide a discrete output to other aircraft systems.

7.4.12 Steep Approach Discrete

The Steep Approach discrete is active whenever Steep Approach has been selected via the pilot (or an Envelope Modulation steep approach case is active) and is typically used to drive a lamp in the Steep Approach switch. For standard steep approach selection method (alternate action switch) this discrete is not provided as the switch must be self lighting. For Discrete I/O category IDs that supply a momentary Steep Approach Switch this lamp driver output is provided to light the switch.

7.5 System Configuration Status

The EGPWC indicates the current hardware, software, databases, Category states and input discretes detected by the system. Each configuration item has an associated configuration message. This is the message that will be read out during Present Status on the RS-232 interface or voice output during Self Test Level 3 to inform the user of the current configuration.

TABLE 7.5-1: CONFIGURATION OPTIONS AND MESSAGES

Selected Option/Condition	Configuration Message
Category 4 (Smart Callout Selected)	**SMART CALLOUT SELECTED**
Category 6 (TA&D Disable)	**TERRAIN AWARENESS DISABLED** **TERRAIN CLEARANCE FLOOR DISABLED**
Category 7 (Flap Reversal Select)	**FLAP WOW REVERSAL SELECTED**
Category 7 (Bank Angle Enable)	**BANK ANGLE SELECTED**
Category 7 (TA&D Alternate Pop Up)	**ALTERNATE POP UP SELECTED**
Category 7 (Obstacle Awareness Enabled)	**OBSTACLE AWARENESS ENABLED**
Category 7 (Peaks Mode Enabled)	**PEAKS MODE ENABLED**
Category 7 (WGS84 Reference Selected)	**GPS ALTITUDE REFERENCE WGS 84 SELECTED**
Category 7 (MSL Reference Selected)	**GPS ALTITUDE REFERENCE MSL SELECTED**
Category 7 (Steep Approach Enabled)	**STEEP APPROACH ENABLED**
Alternate Action Steep Approach Discrete #2 input discrete activated	**STEEP APPROACH SELECTED**
Category 7 (Steep Approach Enabled) AND Alternate Action Steep Approach Discrete #2 input discrete activated	**STEEP APPROACH ACTIVATED**
Category 7 (Steep Approach Enabled) AND Momentary Steep Approach switch configured and Steep Approach (latch) activated	**STEEP APPROACH ACTIVATED**
Glideslope Inhibit input discrete activated	**GLIDESLOPE INHIBITED**
Mode 6 Volume Control Discrete Selected	**MODE 6 LOW VOLUME SELECTED**
GND Audio Suppress (Inhibit)/All Modes Inhibit Discrete Selected OR +28 V Audio Suppress (Inhibit)/All Modes Inhibit Discrete Selected	**EXTERNAL EGPWS INHIBITED** Note: Will only occur for present status as this condition inhibits self tests
Terrain Awareness & TCF Inhibit input discrete activated	**TERRAIN AWARENESS AND TCF DISABLED**
GPWS Inhibit input discrete activated	**GPWS INHIBITED** Note: Will only occur for present status as this condition inhibits self tests

7.5.1 System Status Messages

System Status Messages provide additional information beyond Internal and External Current Faults in order to help isolate the reason for certain EGPWC INOP situations. These messages will be read out during Present Status on the RS-232 interface or voice output during Self-Test Level 2. The table below defines the System Status Messages.

TABLE 7.5.1-1: EGPWC SYSTEM STATUS MESSAGES

System Level Event	INTERNAL INDICATIONS	System Status Message
Bank Angle INOP	BAINOP TRUE	Bank Angle INOP
Envelope Mod INOP	EMINOP Exists and set TRUE	Envelope Modulation INOP
Mode 1 INOP	M1INOP TRUE	Mode 1 INOP
Mode 2 INOP	M2INOP TRUE	Mode 2 INOP
Mode 3 INOP	M3INOP TRUE	Mode 3 INOP
Mode 4 INOP	M4INOP TRUE	Mode 4 INOP
Mode 5 INOP	M5GPWINOP TRUE	Mode 5 INOP
Mode 6 INOP	M6INOP TRUE	Mode 6 INOP
TAD Deselected [1]	Latitude Invalid	Terrain Awareness – No Valid Latitude
	Longitude Invalid	Terrain Awareness - No Valid Longitude
	True Heading Invalid	Terrain Awareness - No Valid True Heading
	Corrected Altitude Invalid	Terrain Awareness - No Valid Corrected Altitude
	Barometric Altitude Rate Invalid	Terrain Awareness - No Valid Altitude Rate
	Roll Invalid	Terrain Awareness - No Valid Roll
	Wx Mode 1 Invalid	Terrain Awareness - Display Mode 1 Invalid
	Wx Mode 2 Invalid	Terrain Awareness - Display Mode 2 Invalid
	Range 1 Invalid	Terrain Awareness - Range 1 Invalid
	Range 2 Invalid	Terrain Awareness - Range 2 Invalid
	Runway Distance invalid	Terrain Awareness - No Valid Runway
	Obstacle Database Invalid	Terrain Awareness: No Valid Obstacle
Terrain Awareness INOP [2]	TAINOP TRUE	Terrain Awareness INOP
Terrain Clearance Floor INOP [3]	TCFINOP TRUE (Always Created)	Terrain Clearance Floor INOP
	Position Error AND TCFINOP TRUE	Terrain Clearance Floor - Position Error
Terrain Not Available [4]	TAD Position Error AND TAINOP FALSE	Terrain Awareness - Position Error
	Outside Regional Database TRUE (MK VI ONLY)	Terrain Awareness – Outside Regional Terrain Database
Windshear INOP [5]	WSINOP TRUE	Windshear INOP

[1] The following preconditions apply: a) The signal must not be faulted since if faulted, signal fault message will exist, b) TAD/TCF Inhibit Discrete is NOT selected, c) TAD Disable program pin is NOT selected, d) The signal condition must NOT be masked via the configuration database and both On-Ground and In-Air masks must be taken into account, e) The associated input signal must exist for the current aircraft configuration.

[2] TAD INOP Preconditions: a) TAD/TCF Inhibit Discrete NOT selected, and b) TAD Disable configuration NOT selected.

[3] TCF INOP Precond itions: a) TCF Disable configuration NOT selected (TRUE causes TCF INOP).

[4] TAD INOP Preconditions: a) TAD/TCF Inhibit Discrete NOT selected, and b) TAD Disable configuration NOT selected.

[5] Windshear INOP Precondition: The windshear algorithm has been defined within the current aircraft configuration

8 CONNECTOR INTERFACE

8.1 Pinout for Front Connectors sorted by pin number

Table 8.1-1: Pin Assignment For Front Connectors Sorted by Pin Number

Connector - Pin	Channel Designation Reference	Signal Usage Summary
J1-01	SYN_1X	Roll Attitude Synchro (X leg)
J1-02	SYN_1Z	Roll Attitude Synchro (Z leg)
J1-03	SYN_2Z	Magnetic Heading Synchro (Z leg)
J1-04	26REF_1H	26VAC Reference #1 (H)
J1-05	SYN_3X	Pitch Synchro (X leg)
J1-06	SYN_3Z	Pitch Synchro (Z leg)
J1-07	SYN_3Y	Pitch Synchro (Y leg)
J1-08	28V_DISC_09	Autopilot Engaged Discrete (+28VDC)
J1-09	28V_DISC_08	Barometric Altitude Validity Discrete (+28VDC)
J1-10	GS_VAL_L	Glideslope Deviation Low Level Validity (-) or Localizer Deviation (+ left)
J1-11	28V_DISC_06	Glideslope Validity Discrete (+28VDC)
J1-12	GND_DISC_09	Terrain Awareness and TCF Inhibit Discrete (Ground)
J1-13	GND_DISC_08	Mode 6 Low Volume Discrete (Ground)
J1-14	GND_DISC_07	Flap Override Discrete (Ground)
J1-15	GND_DISC_06	Glideslope Cancel Discrete (Ground)
J1-16	GND_DISC_05	Landing Gear Discrete (Ground)
J1-17	GND_DISC_04	Audio Inhibit Discrete (Ground)
J1-18	GND_DISC_03	Landing Flaps Discrete (Ground)
J1-19	GND_DISC_02	Glideslope Inhibit Discrete (Ground)
J1-20	GND_DISC_01	ILS Tuned Discrete (Ground)
J1-21	SYN_1Y	Roll Attitude Synchro (Y leg)
J1-22	SYN_2X	Magnetic Heading Synchro (X leg)
J1-23	SYN_2Y	Magnetic Heading Synchro (Y leg)
J1-24	26REF_1L	26VAC Reference #1 (L)
J1-25	OAT_REF	Air Temperature Reference (+5VDC)
J1-26		(Spare)
J1-27		(Spare)
J1-28	28V_DISC_10	Magnetic Heading Validity Discrete (+28VDC)
J1-29	28V_DISC_07	Radio Altitude Validity Discrete (+28VDC)
J1-30	GS_VAL_H	Glideslope Deviation Low Level Validity (+) or Localizer Deviation (+ right)
J1-31	GND_DISC_13	Display Selected Discrete #2 (Ground)
J1-32	GND_DISC_12	Display Selected Discrete #1 (Ground)
J1-33	GND_DISC_11	DH Discrete (Ground)
J1-34	GND_DISC_10	Self Test Discrete (Ground)
J1-35	28V_DISC_05	Landing Gear Discrete (+28VDC)
J1-36	28V_DISC_04	Audio Inhibit Discrete (+28VDC)
J1-37	28V_DISC_03	Landing Flaps Discrete (+28VDC)
J1-38	28V_DISC_02	Glideslope Inhibit Discrete (+28VDC)
J1-39	28V_DISC_01	ILS 1 Tuned Discrete (+28VDC)
J1-40	PWR_H	Power Input: 28 VDC (+)
J1-41	PWR_L	Power Input: 28 VDC (return)
J1-42	GND	Chassis Ground
J1-43	ALT_L	Barometric Altitude (-)
J1-44	OAT_L	Air Temperature (-)
J1-45	RALT_L	Radio Altitude: ARINC 552 or ALT 55 (-)
J1-46	GSDEV_L	Glideslope Deviation - Low Level (+ down)
J1-47		(Spare)
J1-48	28V_DISC_11	Localizer Validity Discrete (+28VDC)

Connector - Pin	Channel Designation Reference	Signal Usage Summary
J1-49	DISC_OUT_9	Terrain Select Relay Output #2
J1-50	MON_OUT_3	Windshear INOP Lamp Output (monitor)
J1-51	DISC_OUT_8	Spare Lamp Output
J1-52	DISC_OUT_7	Steep Approach (momentary) Lamp Output or Windshear Caution Lamp Output
J1-53	GND	Temperature Probe GND
J1-54	DISC_OUT_6	Terrain Select Relay Output #1
J1-55	MON_OUT_2	TAD / TCF INOP Output (monitor)
J1-56	453TX_2A	Terrain Display Output Data #2 (A leg)
J1-57	453TX_2B	Terrain Display Output Data #2 (B leg)
J1-58	453TX_1A	Terrain Display Output Data #1 (A leg)
J1-59	453TX_1B	Terrain Display Output Data #1 (B leg)
J1-60	PWR_H	Power Input: 28 VDC (+)
J1-61	PWR_L	Power Input: 28 VDC (return)
J1-62	ALT_H	Barometric Altitude (+)
J1-63	OAT_H	Air Temperature (+)
J1-64	RALT_H	Radio Altitude: ARINC 552 or ALT 55 (+)
J1-65	GSDEV_H	Glideslope Deviation - Low Level (+ up)
J1-66		(Spare)
J1-67	GND_DISC_14	GPWS Inhibit Discrete (Ground)
J1-68	28V_DISC_12	Attitude Validity Discrete (+28VDC)
J1-69	DISC_OUT_5	Audio On (GND) Output
J1-70	AUD_HL_H	High Level Audio Output - 8Ω (+)
J1-71	AUD_HL_L	High Level Audio Output - 8Ω (-)
J1-72	MON_OUT_1	GPWS INOP Output (monitor)
J1-73	DISC_OUT_4	Flap Override Output (Gnd) or Windshear Warning Output
J1-74	AUD_LL_L	Low Level Audio Output - 600Ω (-)
J1-75	AUD_LL_H	Low Level Audio Output - 600Ω (+)
J1-76	DISC_OUT_3	Glideslope Cancel Output
J1-77	DISC_OUT_2	Glideslope Alert Output
J1-78	DISC_OUT_1	GPWS Warning Output
J2-01	SYN_4X	Configurable Synchro #1 (X leg)
J2-02	SYN_4Y	Configurable Synchro #1 (Y leg)
J2-03	SYN_5Z	Configurable Synchro #2 (Z leg)
J2-04	429RX_5B	Radio Altitude ARINC 429 Input (B leg)
J2-05	429RX_6B	ILS ARINC 429 Input (B leg)
J2-06	429RX_7B	AHRS ARINC 429 Input B leg GPS #2 ARINC 429 Input B leg
J2-07	429RX_8B	Spare ARINC 429 Input (B leg)
J2-08	429RX_4B	GPS ARINC 429 Input (B leg)
J2-09	429TX_2B	EGPWS ARINC 429 Output #2 (B leg)
J2-10	ADC_RXB	SCI Display Range #2 RS-422 Receive B leg (port 2)
J2-11	ADC_RXA	SCI Display Range #2 RS-422 Receive A leg (port 2)
J2-12	GPS_RXB	GPS RS-422 Receive B leg (port 3)
J2-13	429TX_GPS_B	
J2-14	GND	
J2-15	28V_DISC_13	Spare Discrete Input
J2-16	GND	Configuration Module Power Return (Ground)
J2-17	SC_PWR	Configuration Module Power (+5VDC)
J2-18	SYN_4Z	Configurable Synchro #1 (Z leg)
J2-19	SYN_5X	Configurable Synchro #2 (X leg)
J2-20	SYN_5Y	Configurable Synchro #2 (Y leg)
J2-21	429RX_5A	Radio Altitude ARINC 429 Input (A leg)
J2-22	429RX_6A	ILS ARINC 429 Input (A leg)

Connector - Pin	Channel Designation Reference	Signal Usage Summary
J2-23	429RX_7A	AHRS ARINC 429 Input A leg GPS #2 ARINC 429 Input A leg
J2-24	429RX_8A	Spare ARINC 429 Input (A leg)
J2-25	429RX_4A	GPS ARINC 429 Input (A leg)
J2-26	429TX_2A	EGPWS ARINC 429 Output #2 (A leg)
J2-27	ADC_TXA	RS-232 Transmit (port 2) RS-422 Transmit A leg (port 2)
J2-28	GND	GPS RS-232 Common (port 2&3)
J2-29	GPS_RXA	GPS RS-232 Receive (port 3) GPS RS-422 Receive (A leg) (port 3)
J2-30	429TX_GPS_A	
J2-31	GND_DISC_15	Steep Approach Discrete #2 (Ground)
J2-32	SPICLK	Configuration Module Serial Clock
J2-33	SPIMISO	Configuration Module Serial Input
J2-34	26REF_2H	26VAC Reference #2 (H)
J2-35	26REF_2L	26VAC Reference #2 (L)
J2-36	429/422RX_1B	Display Range #1 ARINC 429 Input B leg SCI Display Range #1 RS-422 Input A leg (port 1) IOC #1 ARINC 429 Input B leg
J2-37	429/422RX_1A	Display Range #1 ARINC 429 Input A leg SCI Display Range #1 RS-422 Input B leg (port 1) IOC #1 ARINC 429 Input A leg
J2-38	429RX_2B	Air Data ARINC 429 Input (B leg)
J2-39	429RX_2A	Air Data ARINC 429 Input (A leg)
J2-40	429RX_3B	Display Range #2 ARINC 429 Input B leg IOC #2 ARINC 429 Input B leg
J2-41	429RX_3A	Display Range #2 ARINC 429 Input A leg IOC #2 ARINC 429 Input A leg
J2-42	429TX_1B	EGPWS ARINC 429 Output #1 (B leg)
J2-43	429TX_1A	EGPWS ARINC 429 Output #1 (A leg)
J2-44	ADC_TXB	RS-422 Transmit B leg (port 2)
J2-45	GPS_TXA	GPS RS-232 Transmit (port 3) RS-422 Transmit (A leg) (port 3)
J2-46	GPS_TXB	RS-422 Transmit (B leg) (port 3)
J2-47		
J2-48		
J2-49	SPISEL_CM#	Configuration Module Serial Select
J2-50	SPIMOSI	Configuration Module Serial Output
J3-01	GND	SmartCable Power Return (Ground)
J3-02	CARD_PRES#	PCMCIA Card Present
J3-03	RS232RXD_MON	EGPWS Monitor Port (RS232 Receive)
J3-04	RS232TXD_MON	EGPWS Monitor Port (RS232 Transmit)
J3-05		Reserved
J3-06	SC_PWR	SmartCable Power (+5VDC)
J3-07	SPICLK	SmartCable Serial Clock
J3-08	SPIMISO	SmartCable Serial Input
J3-09	SPIMOSI	SmartCable Serial Output
J3-10	SPISEL_SC#	SmartCable Serial Select
J3-11	GSE_PRES#	GSE Present
J3-12	GND	Ground
J3-13	GND	Ground
J3-14	GND	Ground
J3-15		Reserved
GPS ANT	COAX	GPS COAX connection

Figure 8.1-1, Front Panel Connector Orientation - J1, J2, J3, GPS ANT

Note: The GPS ANT connector only applies to the 965-1190-0xx and the 965-1220-0xx. MK VI EGPWS shown.

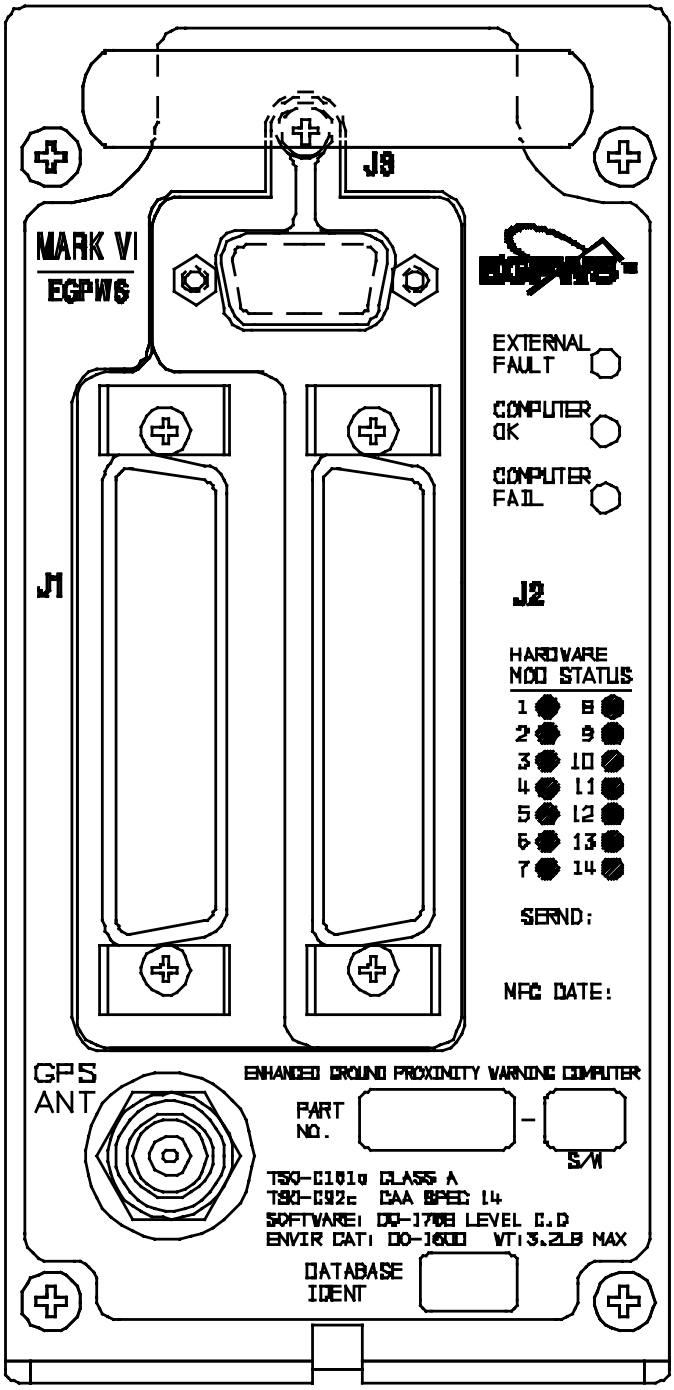
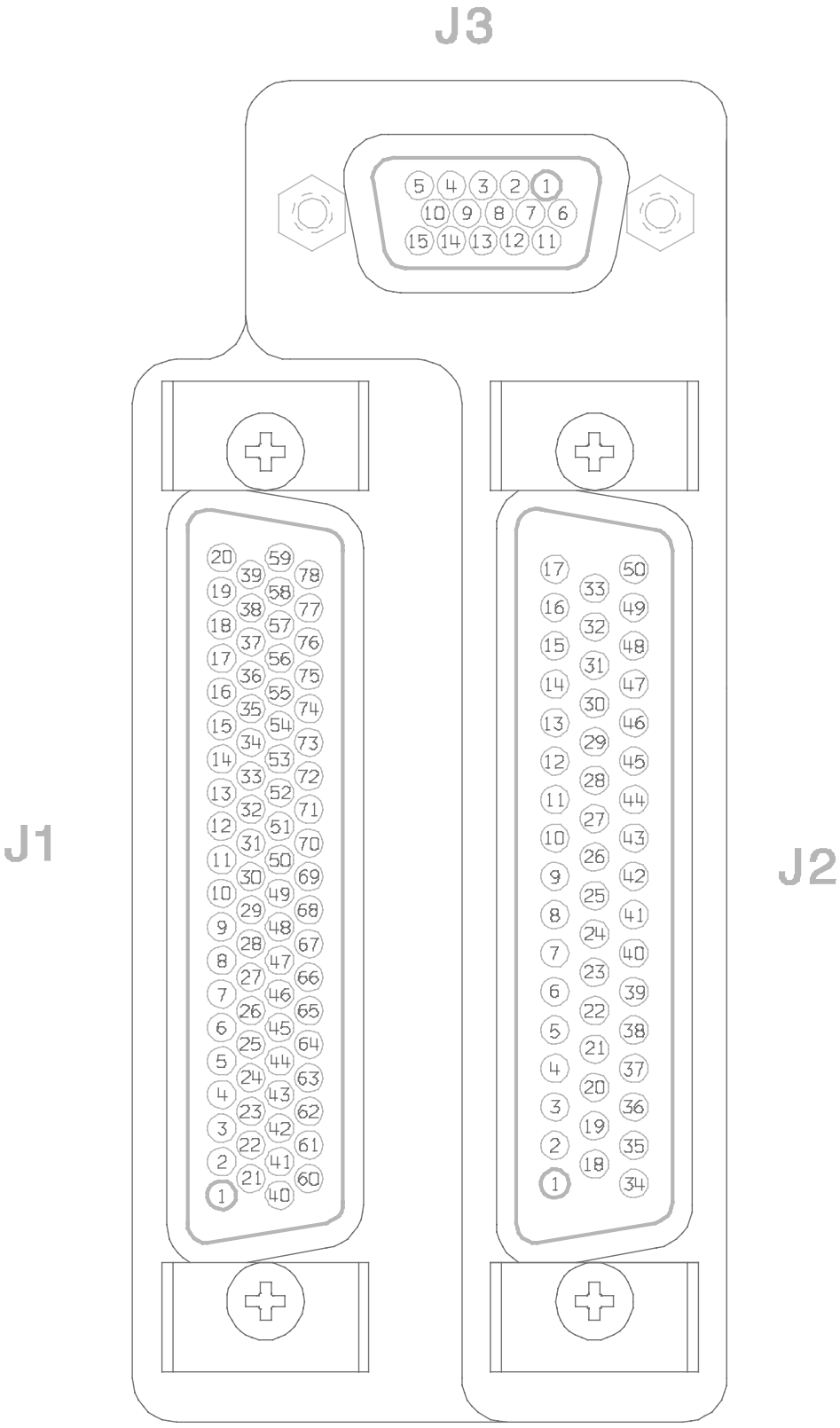


Figure 8.1-2, Connector Pin References - J1, J2, J3



9 DEFINITIONS

The following acronyms are provided for use with this document:

Acronym	Interpretation
AAAS	Alternate Audio Alert Select
ADC	Air Data Computer
ADS	Air Data System
AGC	Automatic Gain Control
AGL	Above Ground Level
AHRS	Attitude Heading Reference System
AIC	Analog Input Controller
AIMS	Airplane Information Management System
ASA	AlliedSignal Aerospace
AOA	Angle of Attack
ASL	Above Sea Level
ATP	Acceptance Test Procedure
BCD	Binary Coded Decimal
BIST	Built in Self Test
BIT	Built In Test
BITE	Built In Test Equipment
BNR	Binary
C/O	Callouts
CAA	Civil Aviation Authority
CAIMS	Central Aircraft Information/Maintenance System
CFDS	Centralized Fault Display System
CFIT	Controlled Flight Into Terrain
CFM	Cubic Feet per Minute
CISRD	CFDS Interface System Requirements Document
CMC	Central Maintenance Computer
COTS	Commercial Off the Shelf
CP	Control Panel
CRS	Course
CW	Clockwise
DAA	Digital/Analog Adapter
DADC	Digital Air Data Computer
DAU	Data Acquisition Unit
DC	Digital Command
DDM	Difference in Depth of Modulation
DEVN	Deviation
DH	Decision Height
DITS	Digital Information Transfer System
DME	Distance Measuring Equipment
DO	Discrete Output
DSP	Digital Signal Processor
DSU	Display Switching Unit
DSWC	Digital Stall Warning Computer
EEPROM	Electrically Erasable Programmable Read Only Memory
EFCP	EFIS Control Panel
EFIS	Electronic Flight Instrument System
EGPWC	Enhanced Ground Proximity Warning Computer
EGPWD	Enhanced Ground Proximity Warning Display
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indication and Crew Alert System
EMI	Electromagnetic Interference
ENB	Enabled
EPROM	Erasable Programmable Read Only Memory
F/T	Functional test
F/W	Fail/Warning

Acronym	Interpretation
FAA	Federal Aviation Administration
FCC	Flight Control Computer
FDR	Flight Data Recorder
FIAS	Flight Inspection Aircraft System
FMC	Flight Management Computer
FMS	Flight Management System
FPM	Feet per Minute
FSEU	Flaps/Slats Electronic Unit
FWC	Fault Warning Computer
G/S	Glideslope
GMT	Greenwich Mean Time
GPS	Global Position System
GPW	Ground Proximity Warning
GPWS	Ground Proximity Warning System
GT	Greater Than
H/W	Hardware
HDG	Heading
HDOP	Horizontal Dilution of Position
HFOM	Horizontal Figure of Merit
HSID	Hardware/Software Interface Document
I/O	Input/Output
IAC	Integrated Avionics Computer
ICD	Interface Control Document
ILS	Instrument Landing System
INOP	Inoperative
IOC	Input/Output Concentrator
IRS	Inertial Reference System
ISO	International Standards Organization
IVS	Inertial Vertical Speed
KT	Knots
KTS	Knots
LED	Light Emitting Diode
LRRA	Low Range Radio Altimeter
LRU	Line Replaceable Unit
LSB	Least Significant Bit
LT	Less Than
MCP	Mode Control Panel
MDA	Minimum Barometric Altitude
MFD	Multi-Functional Display
MKII	Mark Two Warning Computer
MKV	Mark Five Warning Computer
MKVI	Mark Six Warning Computer
MKVII	Mark Seven Warning Computer
MKVIII	Mark Eight Warning Computer
MLS	Microwave Landing System
MMU	Memory Management Unit
MSB	Most Significant Bit
MSL	Mean Sea Level
N/A	Not Applicable
NCD	No Computed Data
ND	Navigation Display
NVM	Non Volatile Memory
OMS	Onboard Maintenance System
P/N	Part Number
PAR	Parity
PC	Personal Computer
PCMCIA	Personal Computer Memory Card Industry Association
PFD	Primary Flight Display

Acronym	Interpretation
PMAT	Portable Maintanence Access Terminal
PP	Program Pin
PVM	Processor/Voice/Memory
PWS	Predictive Windshear System
QFE	Corrected Baro Alt relative to field elevation
QNH	Corrected Baro Alt relative to sea level
RA	Radio Altitude
RAM	Random Access Memory
RDOP	Radar Display Output Processing
ROM	Read Only Memory
RTCA	Requirements and Technical Concepts for Aviation
RTS	Ready to Transmit Signal
RWY	Runway
S/T	Self Test
S/W	Software
SDI	Source/Destination Identifier
SDRD	Software Design Requirements Document
SIG	Significant
SPC	Stall Protection Computer
SRD	System Requirements Document
SSM	Sign Status Matrix
ST	Self Test
SWC	Stall Warning Computer
TA&D	Terrain Awareness & Display
TACAN	Tactical Air Navigation
TAD	Terrain Awareness Display
TBD	To Be Determined
TCAS	Traffic Collision Avoidance System
TCF	Terrain Clearance Floor
TERPS	United States' Standards for Terminal Instrument Procedures
TK	Track
TLB	Translation Lookaside Buffer
TSO	Technical Standing Order
TTL	Tuned To Localizer
UART	Universal Asynchronous Receiver Transmitter
USM	Unsigned Magnitude
UTC	Universal Time Correlation
UUT	Unit Under Test
VDC	Volts, DC
VDOP	Vertical Dilution of Precision
VFOM	Vertical Figure of Merit
VHF	Very High Frequency
VLSI	Very Large Scale Integrated Circuit
VOR	VHF Omni-directional Range
W/S	Windshear
WC	Warning Computer
WGS-84	World Geodetic System 1984 (ICAO Standard)
WX	Weather Radar